



United States
Department of
Agriculture

In cooperation with
University of Nevada
Agricultural Experiment
Station



Natural
Resources
Conservation
Service



United States
Department of
the Interior

National
Park Service

Soil Survey of Great Basin National Park, Nevada



How To Use This Soil Survey

This survey is divided into two parts. Part I includes general information about the survey area; descriptions of the detailed soil map units and soil series in the area; descriptions on use and interpretations of soils and various tables. Part II includes the maps.

The **detailed soil map units** follow the general information about the survey area. These map units can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, note the number of the map sheet, and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** in Part I of this survey, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

A **General Soil Map (GSM)** is available for this survey area. This database consists of a soils map at a scale 1 to 250,000 and descriptions of groups of associated soils. There is a STATSGO U.S. General Soil Map with coverage of this area. A GSM is provided with this report. It is more current than the STATSGO GSM and will be the source for updates to the STATSGO GSM in the future. More information about the General Soil Map for this survey area, is available at the local office of the Natural Resources Conservation Service, and on the internet at:

<http://soildatamart.nrcs.usda.gov/USDGSM.aspx>.

Some standards or values may change as more information is collected and analyzed. Thus, as older published interpretive information becomes outdated, new interpretive data must be generated and tailored to local conditions. This information is added to the Soil Data Mart and Web Soil Survey as needed. See the NRCS soils home page at <http://soils.usda.gov/> for links to these applications and other information about soils and soil surveys.

National Cooperative Soil Survey

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey. This survey was made cooperatively by the United States Department of the Interior, National Park Service; and the University of Nevada Agricultural Experiment Station. The survey is part of the technical assistance furnished to the White Pine County Conservation District.

Major fieldwork for this soil survey was completed in 2008. Soil names and descriptions were approved in 2009. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2009. The most current official data are available at:

<http://websoilsurvey.nrcs.usda.gov/app/>.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

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Cover: Photo represents the high elevations of Great Basin National Park. Map unit 5253 is shown in the image which is an association of Windwash soil, Bricone soil, and Rock outcrop. Bricone soils support the old stand of Bristlecone pine in the center of the photo. Windwash soils support alpine vegetation and Rock outcrop is in the foreground. Mount Washington, a local landmark, is in the background.

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Foreword

This soil survey was developed in conjunction with the National Park Service Inventory and Monitoring Program and is intended to serve as the official source document for soils occurring within Great Basin National Park.

This soil survey contains information that affects current and future land use planning in the park. It contains predictions of soil behavior for selected land uses. The surveys highlight soil limitations, actions needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed to meet the needs of the National Park Service and their partners to better understand the various soil properties present in the park and their affect on various natural ecological properties to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each map unit is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Great Basin National Park.

BRUCE PETERSEN
State Conservationist
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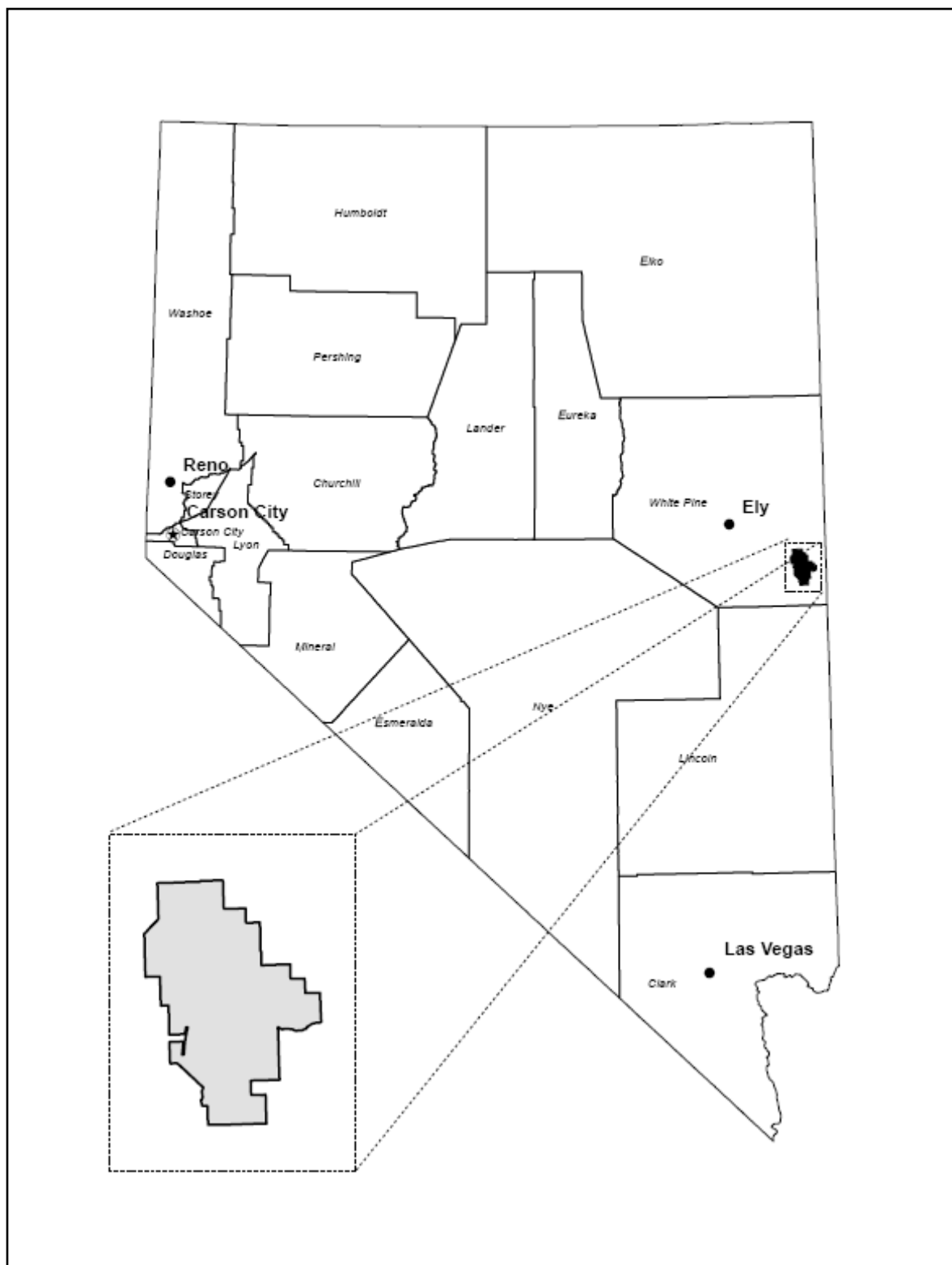


Figure 1—The location of Great Basin National Park, Nevada.

Soil Survey of Great Basin National Park, Nevada

By Curt Leet, Soil Survey Project Leader, Natural Resources Conservation Service

Fieldwork by Curt Leet, Ed Blake, Paul Blackburn, Brien Park, Ian Reid, and Dave Zimmerman, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service
in cooperation with
United States Department of Interior, National Park Service, and the University of Nevada
Agricultural Experiment Station

General Nature of the Survey Area

The survey area is located in the Great Basin National Park. It has an area of 77,075 acres or about 120.4 square miles in size. It is an area of diverse geology, with metamorphic, igneous, and sedimentary formations common in the area. The highest elevation is Wheeler Peak at 13,063 feet and the lowest elevation is along Snake Creek at an elevation of about 6,190 feet. The area is administered by the National Park Service. No major towns or communities are present in the area. Less than one percent is privately owned. The map (Fig. 1) on the facing page shows the location of the Great Basin National Park, Nevada, soil survey.

History of Great Basin National Park

Donna Frederick, local historian and White Pine County resident helped write this section

Long before the white settlers in their search for elusive metals discovered present day White Pine County, hunter-gatherers roamed the land. Western Shoshone, as well as Goshutes, a few Ute and Southern Paiute were the first inhabitants of the area. The hunter-gatherers way of life meant the natives roamed a lot, but stayed sheltered in the cold winter months. These original inhabitants had an extensive knowledge of plant and animal life. This knowledge, shared with the early pioneers, helped many would-be miners and ranchers to survive the rugged winters. The Indians were able to roam freely, following wild game and harvesting pinyon throughout the area.

One of the earliest planned communities found in White Pine County is near Baker, Nevada, located just a few miles east of the park, commonly referred to as Baker Village. Radiocarbon dating and the construction of buildings directly on top of other buildings indicate to archaeologists that the site was at least periodically occupied for three to four centuries, with a peak period of occupation during the thirteenth century. It appears that it was planned, built and maintained to function as both village and structural calendar. Archaeologists feel it is obvious that persons, planned the precise layout of the Baker Village. Complex and orderly arrangement of pithouses and surface adobe structures revealed this was a planned village with most structures aligned to a common compass direction. A large central structure, twice the size of any other building, contained a central hearth. It is believed this large building was built to serve as a ceremonial meeting place, as a house for a leader, or both. Seven pithouses around the central structure also contained a central hearth plus ventilator shafts. Archaeologist's supposition is that

the seven pithouses and storage structures were arranged around the Central structure to mark the winter and summer solstices. The buildings at Baker Village were relatively labor-intensive. There were brick or stone pithouses and aboveground storage structures. Crops such as maize were grown and stored. Wild plants and animal foods made up important ingredients of the diet. Many of the animal bones identified at Baker Village were of mountain sheep, pronghorn, bison, hare and cottontail. Baker Village probably served as a stable community from which small hunting and gatherer parties were sent to obtain food. Although evidence suggests that at least five extended families lived at the site, it is felt that it was unlikely the village had more than 50 dwellers.

Jedediah S. Smith, leading a group of fur trappers for the Rocky Mountain Fur Company, entered the present White Pine County in 1826. Maps show Smith's route basically followed U.S. 6, entering Nevada near the Baker area. Smith was the first person to report an encounter with native tribes in the area and to have an awareness of the extent and drainage pattern of the region. The star attraction in White Pine County is 13,063 foot Wheeler Peak, located in the Great Basin National Park. The early 1800's brought the first white pioneers to the area. "The far tall peak in the desert" fascinated them. An early military topographer, Captain James Hervey Simpson, named this majestic peak "Jeff Davis Peak," after President Lincoln's Secretary of War. The peak was renamed Union Peak in contempt of Jefferson Davis' treason in switching his allegiance. Around 1872, one of the nations leading topographers, Captain George Montague Wheeler was assigned the task of an exploratory survey of various routes west, including the Simpson trail through Nevada. Upon seeing the majesty of the Peak, Captain Wheeler renamed the fabulous White Pine landmark after himself. Wheeler was ordered to revise his reports and confirm the Union Peak title. He retired without rectifying the deliberate fault. The spectacular peak still reigns as "Wheeler Peak." Near the majestic Wheeler Peak, and grand in its' own right is "Jeff Davis" peak.

Prominent among early pioneers in the Snake Valley was George W. Baker who formed the Baker Ranch. In 1892, the Baker Ranch became Baker town. The town of Baker, Baker Lake, and Baker Creek were named for the early rancher. The original post office in Baker was designated on February 18, 1895, and continued service until September 14, 1901, when the mail was re-routed to Garrison, Utah. On November 1, 1909, the United States Postal Service again designated a post office in Baker and it continues in operation.

Mid-1860 brought an adventurer, Absalom S. Lehman, to the area. Absalom tried his hand at prospecting, ranching, and farming with no notable success. His is an adventure story that could stand alone. A dozen entertaining stories, some merely fantasy, others obviously elaborated, have competed with one another for over a century to explain how and when Absalom S. Lehman found the wondrous cave, now known as Lehman Caves in the Great Basin National Park.

The United States Forest Service land was designated as such in 1909. Part of the current park area was designated as the Lehman Caves National Monument in January 24, 1922. On February 13, 1959, 28,000 acres were designated as the Wheeler Peak Scenic area. This encompassed most of the highest elevations of the current park area. (Unrau, 1990) On October 27, 1986, an Act of Congress created Great Basin National Park. Great Basin National Park encompasses 77,100 acres. High mountain peaks, lush meadows, clear mountain streams, and alpine lakes, fascinating limestone caves, a sweeping scenic vista, hiking trails, camp grounds, etc. are included in the park.

The survey area was intermittently logged from the 1860's until 1958. There were sawmills set up in Baker, Snake and Big Wash Creeks. It appears most of the lumber was used by the mines and housing in Baker. The local mills were important for the development of Baker since it was too expensive to haul the lumber from Ely.

Mining has been the main impetus for settlement in White Pine County. With the opening of each new mining district, the opportunity for men to cut the wild hay and graze herds of cattle to supplement the quantities of foodstuff that had to be transported from a distance also developed. By this process, agriculture and stock raising took root. Often, when the mining district played out, the stock raiser remained. Men discovered the productiveness of the valleys and the excellent grazing grounds for stock. When the mines suspended operations, a remnant of the population remained to carry on a pioneer program of raising grain and hay and grazing cattle and sheep over the hills. Many mining camps flourished for a few years and then died. As each mining camp came into existence, a post office was designated, then rescinded, as the transient population moved on to richer fields. The longest lived of

these post offices was at the mining camp of Aurum in North Spring Valley. The post office at Aurum opened on April 4, 1881, and the postal designation was rescinded May 31, 1931. Others include Muncy - July 24, 1882, until March 21, 1898, and revived February 20, 1909, until April 22, 1911; and Seigel January 19, 1907, until July 31, 1909. The large ranches also were designated as post offices long before the centralized mail system was in effect. Cleveland post office opened July 24, 1882, and closed February 15, 1905. The next name for this post office was Taft - February 23, 1909, until April 19, 1919, when it was designated Cleveland Ranch. This post office remained in operation from April 19, 1917, until November 17, 1924, when the mail was routed to the Yelland Ranch. Yelland only held the postal designation from November 1, 1924, through January 25, 1927, when the mail was sent to Aurum.

The eastern portion of White Pine County still has large ranches with both sheep and cattle. Spring Valley was dotted with many small ranches during the early 1900's - their history intertwined with the mining in the area. One of the first settlers in Spring Valley was N.C. Noe. Noe and his family lived in a little two- room house papered with newspapers. An orchard was planted and was bearing fruit when Mrs. Noe died in 1888. Although he lived on the ranch, Noe was a born prospector. His pride and joy was the Grand Deposit - where abandoned buildings may still be seen today. Jim Bews and the Bounty brothers built the homestead known as "Stone House." This landmark is used to direct travelers to destinations in Spring Valley.

A century ago, travelers along the east bench of Spring Valley could visit a large ranch with poplars leading to a home where everyone was made welcome. This was the Cleveland Ranch. This was a fertile farm that boasted the only strawberry patch in the area. A.C. Cleveland had lost a small fortune in the mining game in 1868. He built a toll road between Hamilton and Eureka and made money, but soon lost it through mining ventures. Cleveland borrowed money, and soon had a cattle empire. Alex Kolcheck owned the mines above the Cleveland Ranch at Cleve Creek.

Spring Valley was considered by far the best grazing land in the country. This proved very beneficial for ranchers and the County treasury alike. While farming and ranching perform a significant role in White Pine County economy, due to low annual precipitation, farming is limited to areas that can be irrigated from mountain streams or wells. Cultivated crops consist mostly of grains and forage. One of the major assets White Pine County retains, even after the mineral resources are subtracted, is excellent grazing ranges. Livestock raising predominates in the area. The mountain ranges provide summer pasture for both cattle and sheep. All stock must be "finished" for market in feed yards. Sheep flocks are moved to flat valleys at the approach of winter. Bands of sheep can commonly spend an entire winter without receiving supplemental feed. They eat snow for moisture and consume a variety of desert plants, including the lowly sagebrush.

Physiography, Drainage, and Geology

This survey area is in the Great Basin section of the Basin and Range physiographic province and a part of Major Land Resource Area 28A. The Basin and Range physiographic province is characterized by tectonism, expressed by the uplifted block faulted mountain ranges and down-dropped faulted basin valleys, and was a part of the Cordilleran Miogeosyncline. Other active geologic processes include block faulting and uplift, metamorphism, igneous intrusion, erosion, sedimentation, and deposition.

The mountain ranges in the area are composed primarily of Paleozoic sedimentary rock and include late Precambrian rocks; the lower strata is composed of quartzite and granite

The oldest rocks are a part of the Precambrian McCoy Creek Group, Paleozoic aged limestone, dolomite, and quartzite, (with some components of siltstones and sandstones) that dominate the survey area. The southern half of the park is composed of Paleozoic aged limestone, dolomite, and other sedimentary and post-sedimentary rocks. The north half of the survey area is dominated by quartzite, with intrusive pockets of granite.

During the Miocene epoch about 20 million years ago the Great Basin began to stretch east to west. The stretching and faulting began about 20 million years ago along the Wasatch front and progressed westward to the Sierra front ending about 5 million years ago. The current topography of the park is the result of extensive alpine glaciation during the Pleistocene epoch, from about 40,000 to 60,000 years ago and again from about 14,000 to 25,000 years ago. These glaciers carved out several cirques, such as

Lehman cirque on the northeast side of Mount Wheeler. Each glacial period left behind till deposit as evidenced by the end and ground moraine material in Lehman and Snake Creeks.

Recreation and Transportation

Recreation in the park mainly consists of cave tours, camping, and hiking. Camping and hiking is most popular during late spring through late fall. Elk, mule deer, and antelope are the common big game animals found.

The park is accessible from US Highway 50 from the east or west turning south on state Highway 487 to the town of Baker. The Great Basin National Park visitor center is located in the town of Baker and the park itself is just a few miles to the west of the visitor center.

Climate

The following climate narrative was prepared by the Natural Resources Conservation Service Water and Climate Center, Portland, Oregon. Tim Stack, Natural Resources Conservation Service, Ely, helped prepare this section.

Table 1 gives data on temperature and precipitation for the survey area. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, average temperatures are 31.2 degrees. The average daily minimum temperature is 20.8 degrees. The lowest temperature on record was -19 degrees on December 22, 1990. Inversions are common at night in almost all months due to the high elevation and dry climate, and in general the lowest valleys often have the coldest night temperatures while areas above the inversion are much warmer.

In summer, the average temperature is 68.6 degrees with the average daily maximum temperature at 82.5 degrees. The highest temperature recorded was 96 degrees on August 1, 2000.

The average annual precipitation is 13 inches. Of this amount only 25 to 30 percent typically falls within the June to August frost free period. The heaviest 1 day precipitation amount of 1.85 inches occurred on May 24, 1995. Thunderstorms occur about 33 days each year, and most occur between mid-June and early September.

Snowfall is measured by snow survey crews on March 1 and April 1 at three snow course sampling areas in the Baker Creek watershed. Snow depth and Snow Water Equivalent are measured at these sites through the cooperative Snow Survey and Water Supply Forecasting program in the western United States. These data are from measurements taken 1942 through 2008 and are shown in the Tables below. Averages from 1971–2008 are shown for comparison purposes with the 30 year average of 1971–2000.

Average Snow Depth in Inches-March 1

Years	1971-2000	1971-2008	1942-2008
Baker Creek #1 Elevation 7920	21.6	22	22.6
Baker Creek #2 Elevation 8950	43.3	44	46
Baker Creek #3 Elevation 9250	44.5	46.7	47.9

Average Snow Depth in Inches-April 1

Years	1971-2000	1971-2008	1942-2008
Baker Creek #1 Elevation 7920	20.1	20.2	19.7
Baker Creek #2 Elevation 8950	47.8	47.2	48.6
Baker Creek #3 Elevation 9250	56.1	56	55.7

Most likely, elevations over 7,000 feet in leeward zones can receive in excess of 70 inches annually. During the period 1971 – 2000 the greatest snow depth at any one time was 30 inches at Great Basin National Park recorded on February 20, 1993 at the weather station. On average about 49 days have at least 1 inch of snow on the ground.

Snow Water Equivalent is a measure of the amount of water contained within the snowpack and is used in water supply forecasting. Averages of data collected in March and April at all three sites are shown below.

Average Snow Water Equivalent in Inches-March 1

Years	1971-2000	1971-2008	1942-2008
Baker Creek #1	5.1	5.3	5.6
Baker Creek #2	10.9	10.5	11.8
Baker Creek #3	11.7	12.3	13.2

Average Snow Water Equivalent in Inches-April 1

Years	1971-2000	1971-2008	1942-2008
Baker Creek #1 Elevation 7920	5.8	5.7	6
Baker Creek #2 Elevation 8950	14.1	14.7	15.5
Baker Creek #3 Elevation 9250	17.1	17.4	17.7

NRCS uses the latest 30 year average 1971-2000 to calculate percent of average. For example if (SWE) is 16 inches at Baker Creek #2 in April then $16/14.1=1.13 \times 100$ is referred to as 113% of average.

How This Survey Was Made

This survey was made in conjunction with the National Park Service's Soil Inventory and Monitoring Program to provide information about the soils and miscellaneous areas in Great Basin National Park. A scoping meeting was held in 2005 with park staff to identify their soil resource information needs and to relate those needs to the existing soil survey. Of particular importance to park staff, was information regarding the relationship of soil types, to existing or potential habitats of plant species of special concern, including invasive species and threatened and endangered species. Following the meeting, additional interviews were conducted to identify particular geographic areas of concern. This process identified several soil map units of the previous soil survey and other areas that required additional information. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus,

during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soils scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on ecological sites under defined levels of management are assembled from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The Great Basin National Park was originally mapped in 1991. Field work for the update commenced in the summer of 2007 and involved locating the original series type location as well as visiting areas the park staff had concerns with or which required greater detail. Field work continued in the summer of 2008 and concentrated on looking at areas of concern pointed out by the Great Basin National Park staff. This involved establishing new series for broadly defined components. The digital data was updated as new map units were created, and as edits were made to the original soil lines. Some edits were made as the result of referring to the geology layer the park has on their web site.

During the soil survey, ecological site and soil component relationships were observed, and soil-site correlation concepts were established to help in designing the map units. Soil and plant specialists tested the concepts during mapping and collected field documentation at numerous points across the landscape.

The following is a summary of important concepts used in the soil mapping project.

Temperature Concepts

General temperature breaks on nonaspect sites where south aspects are warmer and north aspects are colder;

<u>Temp Regime</u>	<u>Elevation</u>	<u>Precipitation</u>	<u>Indicator species</u>
Mesic	6,500 ft	10 to 12" ppt	Black sagebrush, Wyoming big sagebrush, (bluebunch wheatgrass will occur above 10 " ppt.)
Frigid	< 8,200 ft	12 to 20" ppt	Bluebunch wheatgrass, mountain big sagebrush, black sagebrush, snowberry, pinyon-juniper woodlands, curlleaf mountainmahogany in pinyon woodlands or low savannahs
Crylic	> 8,200 ft	> 18 to 44" ppt	Curlleaf mountainmahogany, fir, Columbia needlegrass, mountain brome, nodding brome, Letterman needlegrass,

This survey area includes mesic, frigid and cryic soil temperature regimes. Soil temperature regimes generally are at lower elevations on the east side of the mountain range since they are not receiving as much late afternoon solar radiation and heating. Temperatures start dropping sooner than on the western side of the range. The following general class relationships for mean annual soil temperature (MAST) and soil temperature regimes were observed in this survey:

Cool mesic (8-11 degree C., 47 to 52 F MAST) soils are common at lower elevation of the survey area up to about 6,500 feet elevations, however can occur at higher elevation on southwesterly aspects. The dominant shrubs are generally composed of black sagebrush and Wyoming big sagebrush.

Warm frigid (7-8 degree C., 45 to 47 F MAST) soils range from about 6,500 to about 7,500 feet, with dominant shrubs consisting of black sagebrush and Wyoming big sagebrush. However mountain big sagebrush does occur on northerly aspects.

Cool frigid (5.5-7 degree C., 42 to 45 F MAST) soils range from about 7,500 to 8,200 feet elevation, with the dominant shrubs consisting of mountain big sagebrush and low sagebrush on non-limestone parent materials such as quartzite, welded tuff and granite. Black sagebrush dominates on limestone parent materials with cool frigid soils. Mountain big sagebrush is present on non-aspect sites at about 7,600 feet and higher. Snowberry, antelope bitterbrush, serviceberry, and oceanspray generally occur within the mountain big sagebrush community.

Warm cryic (4-7 degree C., 40 to 45 F MAST) soils are present at elevations above 8,200 feet elevations to about 9,600 feet. Warm cryic vegetation consists of mountain big sagebrush, curlleaf mountainmahogany, aspen, and white fir.

Cool cryic (3-5 degree C., 37 to 41 F MAST) soils range from about 9,300 to 10,600 feet with dominant vegetation consisting of mountain big sagebrush, Engelmann spruce, and aspen. At the highest elevations of the cool cryic zone, limber pine, and bristlecone pine are common. Engelmann spruce starts at about 9,200 feet in drainageways. Columbia needlegrass, mountain brome, Letterman needlegrass and oniongrass are common throughout the cryic zone.

Cold cryic (5-7 degree C., 34 to 40 F MAST) soils are above 10,600 feet dominated by alpine vegetation. "Krumholtz" are common on the lowest alpine sites. Low-growing perennial grasses and forbs occur throughout the alpine zone.

Other Mapping concepts

The flooding potential of inset fan soils that are correlated to a site such as Loamy 8-10" P.Z. is rare and very brief, while on Loamy Fan ecological sites, flooding is occasional and brief. Soils that are correlated to upland wash or valley wash sites generally receive frequent flooding with brief to long duration.

Basin big sagebrush is common in inset fans and in drainageways in mountains and hills. Basin big sagebrush can also occur on uplands in the transition from Wyoming to mountain big sagebrush. A cambic horizon is the most common soil property correlated with the occurrence of big sagebrush in drainageways.

It is not common for soils to have mollic epipedons if they support a Loamy 8 to 10" P.Z. ecological site. Ecological sites receiving 10 to 12 inches of precipitation generally have mollic epipedons.

Black sagebrush is common on limestone and dolomite derived soils up to about 9,600 feet and welded tuff derived soils up to 7,500 feet. Accumulation of secondary calcium carbonate in near surface horizons of soils formed on non-limestone parent materials can be sufficient to favor black sagebrush rather than low or big sagebrush. (see discussion below)

Low sagebrush and Nevada bluegrass are excellent indicators of the presence of a soil with a fine-textured argillic horizon that occurs within 7 inches of the surface. Low sagebrush does not tolerate calcium carbonate in the upper part of the profile. Low sagebrush has a lower biological oxygen demand than most big sagebrush, so it can tolerate saturated soil conditions in the upper 10 inches for periods of greater than 2 weeks in the spring. It is also more drought tolerant, so it will grow on sites with lower available water holding capacity (shallow soils or skeletal soils with greater than 50 percent rock fragments) where mountain big sagebrush will not grow.

Soils with argillic horizons are common on hills and mountains at lower elevations in the cool mesic and frigid soil temperature zones and in soils derived from quartzite and granite. The most developed argillic horizons are formed in quartzite and the weakest are formed on granitic soils. At low elevations, soils have ochric epipedons. Soils with mollic epipedons occur at about 7,000 feet (2150 meters) elevation and 10 inches of annual precipitation. Argillic horizons can form in limestone parent material above 10,000 feet, where the soil moisture is sufficient to leach the calcium from the Bt horizon.

Pinyon and juniper encroachment corresponds with elevation and precipitation changes as well. As elevation increases, the presence of carbonate decreases along with an increase in organic matter content, and thickness of the mollic epipedon. Soils with thicker mollic epipedons and increased organic matter content support either low sagebrush or mountain big sagebrush and are commonly heavily encroached by pinyon and juniper. As elevation continues to increase and annual precipitation increases over 14 inches, soils occurring on convex slopes of all aspects are dominated by pinyon and juniper woodlands. Tree ring counts indicate that singleleaf pinyon have on the average 10 rings per inch if the tree is at least 4 inches in diameter. The tree ring data is used with other established vegetative criteria such as the presence and absence of grasses and shrubs and soil properties such as thickness of the mollic epipedons (if present) to consistently correlate ecological sites in the survey. Pinyon-juniper forestland soils typically support understories of black sagebrush, low sagebrush or mountain big sagebrush. Mollic epipedons are typically 7 to 10 inches thick where low sagebrush dominates the understory and 10 to 14 inches thick where mountain big sagebrush dominates the understory.

Concave areas having soils with mollic epipedons greater than 10 inches thick, and color values of 4 dry and 2 moist are commonly correlated to rangeland ecological sites dominated by grasses and a lesser amounts of shrubs. Presently, some landforms with well-developed mollic epipedons are covered by pinyon and juniper stands. The soils in these wooded areas do not reflect development from current vegetation and are correlated to rangeland ecological sites, not forestland. The trees are considered to have encroached and the area is likely to return to a grass and shrub land when the natural fire cycle returns. Thus, soils having thick and dark mollic epipedons are typically correlated to a rangeland ecological site.

Other soils that have thick (pachic) mollic epipedons with dark color values are associated with aspen-dominated forestland ecological sites. The presence of the mollic epipedon in aspen woodlands is attributed to higher understory production of grasses and shrubs along with the addition of leaf and twig debris. Except for aspen-dominated forestland ecological sites, areas of forestland commonly lack the development of a mollic epipedon. Forest soils are moist as snow melts in the spring.

Ponderosa pine is found on the Snake Range and in Great Basin National Park. Soil properties correlated to the production of ponderosa pine are highly variable. They can occur on fine-textured soils developed from volcanic ash, coarser textured soils derived from granite, and cobbly soils dominated by limestone parent material. Mountain drainageways with ponderosa pine stands are influenced by snowpack and rain runoff, and have growth rings as few as 3 or 4 per inch. The ponderosa stands appear

to be relics that were not completely logged for mine shaft supports. Evidence of heavy ponderosa pine logging in the area is supported by historical documents, photos and tree stumps in the surrounding landscape.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

1. Lithic Calcixerolls-Lithic Haploxerolls-Rock outcrop

(fig. 2)

Shallow, well drained, mesic soils formed in residuum from limestone on low elevation hills and mountains. Vegetation consists mainly of black sagebrush, Utah juniper, singleleaf pinyon and littleleaf mountainmahogany.

Setting

Landform: Hills and mountains

Slope: 15 to 75 percent

Elevation: 6,230 to 9,090 feet

Precipitation: 12 to 16 inches

Average annual air temperature: 39 to 50 degrees F.

Frost free period: 70 to 110 days

Parent material and geology: Residuum and colluvium dominantly from limestone or dolomite

Composition

Percent of survey area: 5 percent

Lithic Calcixerolls—41 percent

Lithic Haploxerolls —30 percent

Rock outcrop—20 percent

Minor components—9 percent

Soil Properties

Lithic Calcixerolls (Radol and similar soils)

Depth class: Shallow

Drainage class: Well drained

Texture of the surface layer: Very gravelly loam

Texture of the subsoil: Extremely cobbly loam or very gravelly loam

Depth to hard limestone bedrock: 14 to 20 inches

Slopes: 30 to 75 percent

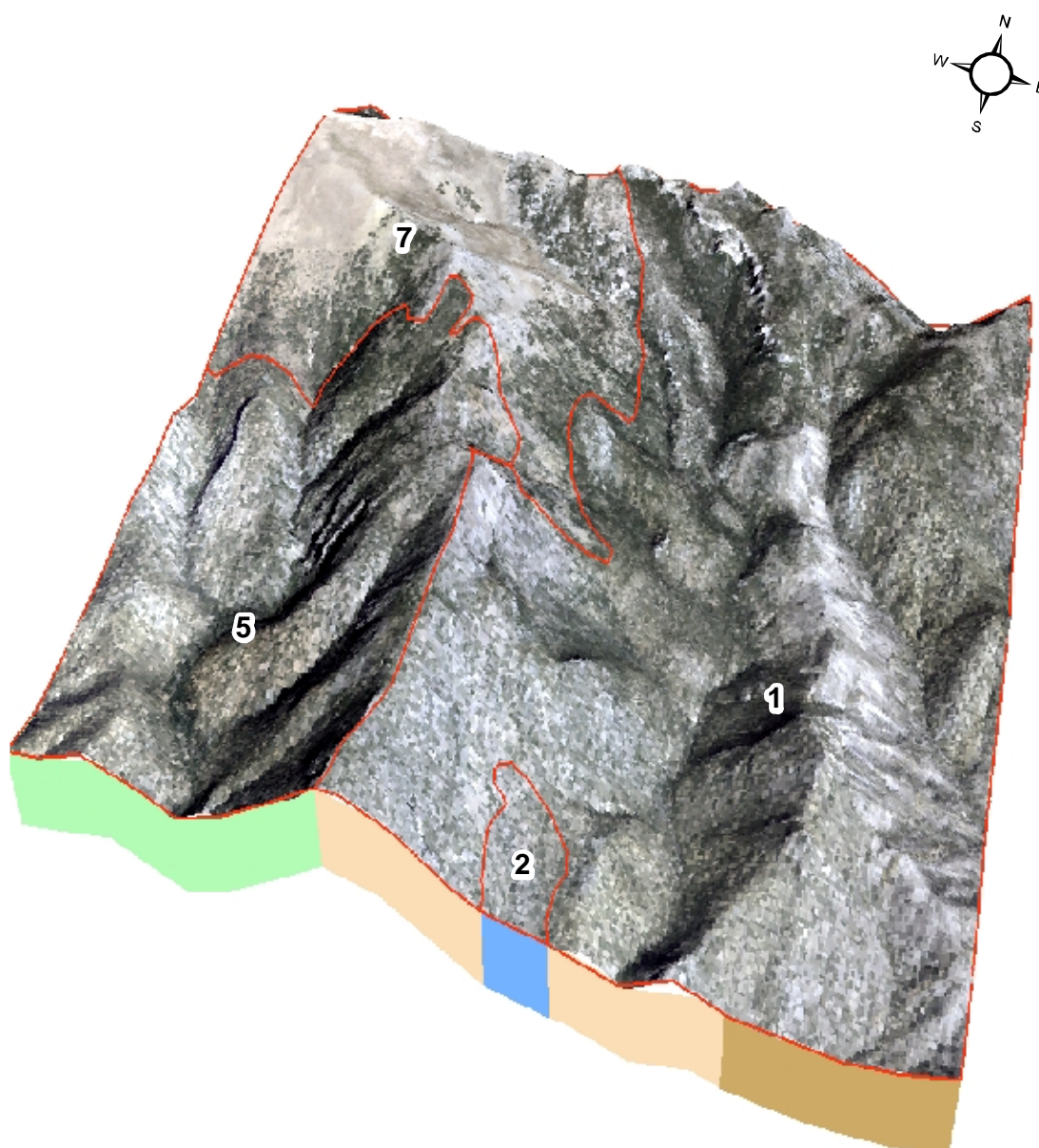
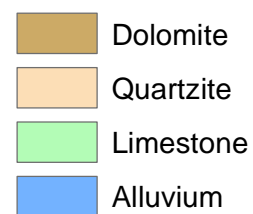


Figure 2 - Pattern of general soil map units in the Horse Heaven area. General soil map units 1 and 5 are in areas of limestone. General soil map unit 7 is on higher elevation mountains in areas with quartzite lithology. General soil map unit 2 is in areas of alluvium.



Lithic Haploxerolls (Hyzen and similar soils)*Depth class:* Very shallow and shallow*Drainage class:* Well drained*Texture of the surface layer:* Extremely stony loam*Texture of the subsoil:* Extremely stony loam*Depth to hard limestone bedrock:* 6 to 14 inches*Slopes:* 15 to 75 percent**Rock outcrop*****Use and management:****Major uses:* Most of the area was formerly used for livestock grazing and is currently used for wildlife habitat and recreation*Management concerns:* Steep slopes, low annual precipitation, and shallow depth to bedrock**2. Petrocalcic Palexerolls-Aridic Calcixerolls-Aridic Argixerolls**

(fig. 3)

*Shallow and very deep, well drained mesic soils formed in alluvium dominantly from limestone on low elevation fan piedmonts and mountains. Vegetation consists of black sagebrush, Wyoming big sagebrush, and Utah juniper.****Setting****Landform:* Fan piedmonts and mountains*Slopes:* 4 to 50 percent*Elevation:* 6,200 to 7,610 feet*Precipitation:* 12 to 18 inches*Average annual air temperature:* 43 to 48 degrees F.*Frost free period:* 70 to 110 days*Parent material and geology:* Alluvium from limestone***Composition****Percent of survey area:* 2 percent*Petrocalcic Palexerolls—*40 percent*Aridic Calcixerolls—*39 percent*Aridic Argixerolls—*21 percent*Minor components—*Less than 1 percent***Soil Properties*****Petrocalcic Palexerolls (Borvant and similar soils)***Depth class:* Shallow to a cemented hardpan*Drainage class:* Well drained*Texture of the surface layer:* Extremely gravelly loam*Texture of the subsoil:* Extremely gravelly loam*Substratum:* Indurated hardpan*Depth to hardpan:* 10 to 20 inches*Slope:* 4 to 30 percent**Aridic Calcixerolls (Eenreed and similar soils)***Depth class:* Very deep*Drainage class:* Well drained*Texture of the surface layer:* Very gravelly loam*Texture of the subsoil:* Very gravelly loam or extremely gravelly loam*Substratum:* Extremely gravelly loam or extremely gravelly sandy loam

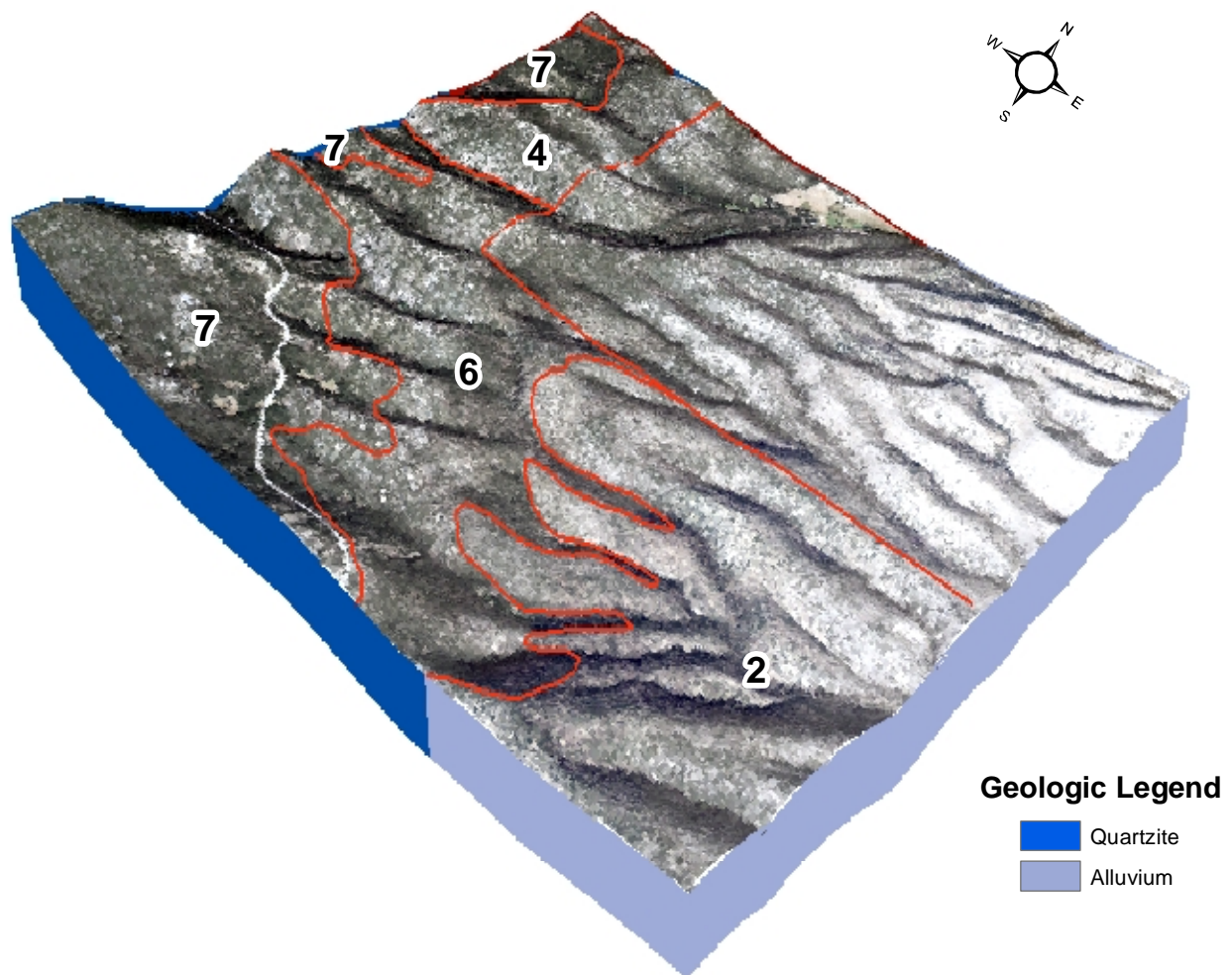


Figure 3 - Pattern of general soil map units in the vicinity of Mill Creek. General soil map unit 2 is on low elevation fan piedmonts and mountains, map units 4 and 6 are on middle elevation hill and mountains, and map unit 7 is on high elevation mountains. This pattern illustrates the trend toward cooler soils and related plant communities with increasing elevation.

Depth to bedrock: Greater than 60 inches

Slope: 4 to 50 percent

Aridic Argixerolls (Millan and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the surface layer: Very gravelly loam

Texture of the subsoil: Extremely gravelly clay loam or very gravelly clay loam

Substratum: Extremely gravelly sandy loam or very gravelly loam

Depth to bedrock: Greater than 60 inches

Slope: 15 to 50 percent

Use and management:

Major uses: Most of the area was formerly used for livestock grazing and is currently used for wildlife habitat and recreation

Management concerns: Steep slopes and low annual precipitation

3. Typic Argixerolls-Aquic Cumulic Haplocryolls-Oxyaquic Haplocryepts

Shallow to very deep, well drained, frigid and cryic soils formed in alluvium and glacial till from limestone and quartzite on middle elevation fan piedmonts and mountains. Vegetation consists of black sagebrush, basin big sagebrush and mountain big sagebrush, Utah juniper, singleleaf pinyon, quaking aspen and white fir.

Setting

Landform: Fan piedmonts and mountains

Slope: 2 to 75 percent

Elevation: 6,200 to 9,400 feet

Precipitation: 16 to 28 inches

Average annual air temperature: 37 to 43 percent

Frost free period: 40 to 70 days

Parent material and geology: Till, outwash and alluvium from quartzite with minor amounts of granite and limestone

Composition

Percent of survey area: 1 percent

Typic Argixerolls—25 percent

Aquic Cumulic Haplocryolls—22 percent

Oxyaquic Haplocryepts—14 percent

Typic Calcixerolls—13 percent

Cumulic Haploxerolls—10 percent

Lithic Calcixerolls—9 percent

Minor components—7 percent

Soil Properties

Typic Argixerolls (Glideski and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the surface layer: Gravelly loam

Texture of the subsurface layer: Very gravelly loam or very cobbly loam

Subsoil: Extremely cobbly sandy clay loam or extremely stony loam

Substratum: Extremely stony loam, extremely stony coarse sandy loam or extremely stony loamy coarse sand

Depth to bedrock: Greater than 60 inches

Slope: 4 to 15 percent

Aquic Cumulic Haplocryolls (Brokit and similar soils)

Depth class: Very deep

Drainage class: Somewhat poorly or moderately well drained

Texture of the surface layer: Very stony highly organic loam

Texture of the substratum: Extremely cobbly loamy coarse sand

Depth to bedrock: Greater than 60 inches

Slopes: 4 to 15 percent

Oxyaquic Haplocryepts (Lemcave and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the surface layer: Slightly decomposed plant material

Texture of the mineral soil surface: Extremely gravelly sandy loam

Texture of the subsoil: Extremely cobbly loamy coarse sand, extremely cobbly coarse sandy loam or very cobbly sandy loam

Texture of the substratum: Extremely gravelly loamy coarse sand, extremely cobbly loamy coarse sand or very cobbly loamy coarse sand

Depth to bedrock: Greater than 60 inches

Slopes range: 8 to 50 percent

Typic Calcixerolls (Canyonfork and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the soil surface: Very gravelly fine sandy loam

Texture of the subsoil: Extremely cobbly loam, extremely gravelly fine sandy loam, very gravelly sandy loam, very gravelly fine sandy loam, extremely gravelly sandy loam, or very gravelly loam

Depth to bedrock: Greater than 60 inches

Slopes range: 4 to 15 percent

Cumulic Haploxerolls (Ripcon and similar soils)

Depth class: Very deep

Drainage class: Moderately well drained

Texture of the soil surface: Gravelly loam

Texture of the subsoil: Extremely gravelly sandy loam or extremely gravelly loam

Depth to bedrock: Greater than 60 inches

Slopes range: 2 to 8 percent

Lithic Calcixerolls (Noski and similar soils)

Depth class: Shallow

Drainage class: Well drained

Texture of the soil surface: Gravelly loam

Texture of the subsoil: Extremely gravelly sandy loam, extremely gravelly fine sandy loam, very gravelly sandy loam, or very gravelly fine sandy loam

Depth to bedrock: 14 to 20 inches

Slopes range: 4 to 75 percent

Use and management:

Major uses: Most of the area was formerly used for livestock grazing and is currently used for wildlife habitat and recreation

Main management concerns: Steep slopes and areas of shallow soils. There are also areas of wet soils along perennial channels

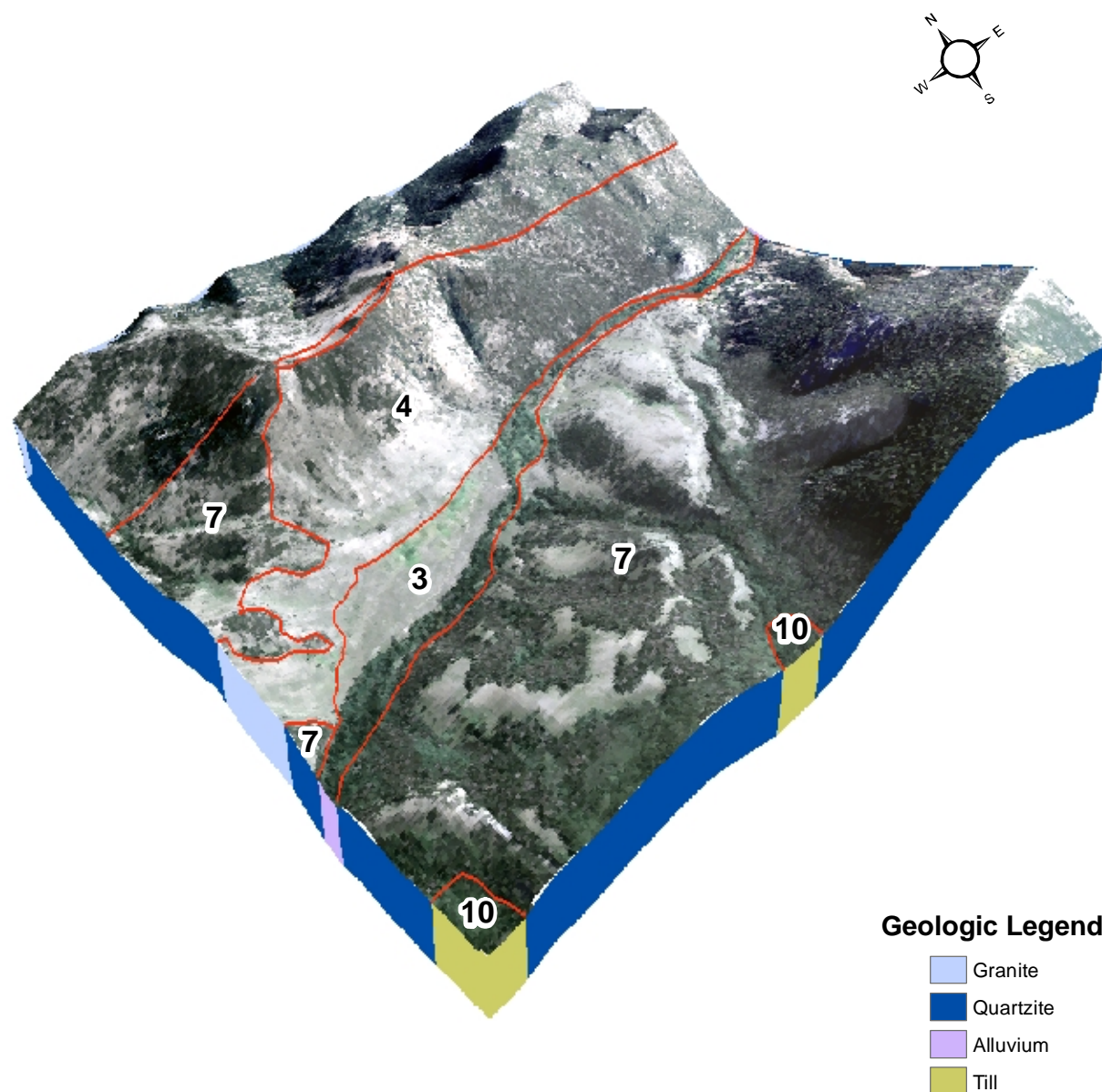


Figure 4 - View of Strawberry Creek Area. General soil map unit 3 is on alluvium and till in valleys. Map units 7 and 10, are on middle and high elevation mountains with quartzite parent materials. Map unit 4 is on granitic mountains at middle elevations.

4. Aridic Argixerolls-Rock outcrop

(fig. 4)

Shallow to very deep, well drained frigid soils formed in residuum and colluvium from granite on middle elevation hills and mountains. Vegetation consists of mountain big sagebrush, Utah juniper, and singleleaf pinyon.

Setting

Landform: Hills and mountains

Slope range: 4 to 75 percent

Elevation: 6,530 to 8,730 feet

Precipitation: 16 to 20 inches

Average annual air temperature: 39 to 43 degrees F.

Frost free period: 40 to 70 days

Parent material and geology: Colluvium a and residuum from granite

Composition

Percent of survey area: 4 percent

Aridic Argixerolls— 84 percent

*Rock outcrop—*16 percent

*Minor components—*Less than 1 percent

Soil Properties

Aridic Argixerolls (Garnel, Closkey and similar soils)

Depth class: Shallow to very deep

Drainage class: Well drained

Texture of the surface layer: Very gravelly coarse sandy loam

Texture of the subsoil: Very gravelly sandy clay loam

Depth to soft bedrock: 10 to 40 inches

Slope: 4 to 75 percent

Rock outcrop

Use and Management

Major concerns: Most of the area was formerly used for livestock grazing and is currently used for wildlife habitat and recreation

Main management concerns: Steep slopes and areas of shallow soils

5. Lithic Xeric Torriorthents-Lithic Calcixerolls-Lithic Haploxerolls

Shallow to moderately deep, well drained frigid and mesic soils formed in residuum and colluvium from limestone on middle elevation hills and mountains. Vegetation consists of black sagebrush, curleaf mountainmahogany, Utah juniper, and singleleaf pinyon.

Setting

Landform: Hills and mountains

Slope range: 15 to 75 percent

Elevation: 6,230 to 9,930 feet

Precipitation: 10 to 16 inches

Average annual air temperature: 39 to 52 degrees F.

Frost free period: 70 to 130 days

Parent material and geology: Residuum and colluvium from limestone

Composition

Percent of survey area: 6 percent
*Lithic Xeric Torriorthents—*28 percent
Lithic Calcixerolls— 27 percent
*Lithic Haploxerolls—*20 percent
*Rock outcrop—*18
*Minor components—*7 percent

Soil Properties**Lithic Xeric Torriorthents (Logring and similar soils)**

Depth class: Very shallow and shallow
Drainage class: Well drained
Texture of the surface layer: Extremely gravelly loam
Texture of the subsoil: Very gravelly loam or very gravelly sandy loam
Depth to hard bedrock: 7 to 14 inches
Slope: 30 to 75 percent

Lithic Calcixerolls (Radol and similar soils)

Depth class: Shallow
Drainage class: Well drained
Texture of the surface layer: Very gravelly loam
Texture of the subsoil: Extremely cobbly loam or very gravelly loam
Depth to hard limestone bedrock: 14 to 20 inches
Slope: 30 to 75 percent

Lithic Haploxerolls (Hyzen and similar soils)

Depth class: Very shallow and shallow
Drainage class: Well drained
Texture of the surface layer: Extremely stony loam
Texture of the subsoil: Extremely stony loam
Depth to hard limestone bedrock: 6 to 14 inches
Slope: 15 to 75 percent

Use and Management

Major concerns: Most of the area was formerly used for livestock grazing and is currently used for wildlife habitat and recreation
Main management concerns: Steep slopes, low annual precipitation, and depth to bedrock

6. Lithic Argixerolls-Xeric Haplocryolls

Shallow and very deep, well drained, frigid and cryic soils formed in residuum and colluvium from quartzite on middle elevation hills and mountains. Vegetation consists of black sagebrush, mountain big sagebrush, Utah juniper, singleleaf pinyon and curlleaf mountainmahogany.

Setting

Landform: Hills and mountains
Slope range: 8 to 50 percent
Elevation: 7,090 to 10,370 feet
Precipitation: 16 to 28 inches
Average annual air temperature: 37 to 43 degrees F.
Frost free period: 40 to 70 days
Parent material and geology: Residuum and colluvium from quartzite

Composition

Percent of survey area: 1 percent
 Lithic Argixerolls—82 percent
 Xeric Haplocryolls—18 percent
 Minor components—Less than 1 percent

Soil Properties**Lithic Argixerolls (Bellenmine and similar soils)**

Depth class: Shallow
 Drainage class: Well drained
 Texture of the surface layer: Extremely gravelly sandy loam
 Texture of the subsoil: Very gravelly clay loam or extremely gravelly clay loam
 Depth to hard bedrock: 14 to 20 inches
 Slope: 8 to 30 percent

Xeric Haplocryolls (Basinpeak and similar soils)

Depth class: Very deep
 Drainage class: Well drained
 Texture of the surface: Very gravelly loam
 Texture of the substratum: Extremely gravelly coarse sandy loam, extremely gravelly loam, extremely gravelly sandy loam
 Depth to bedrock: Greater than 60 inches
 Slope: 8 to 50 percent

Use and Management

Major concerns: Most of the area was formerly used for livestock grazing and is currently used for wildlife habitat and recreation
 Main management concerns: Steep slopes and areas of shallow soils

7. Xeric Haplocryepts- Lamellic Haplocryepts-Pachic Haplocryolls

Shallow to very deep, well drained, cryic soils formed in residuum and colluvium from quartzite on high elevation mountains. Vegetation consists of low sagebrush, curlleaf mountainmahogany, mountain big sagebrush, quaking aspen, white fir, and Engelmann's spruce.

Setting

Landform: Mountain
 Slope range: 8 to 75
 Elevation: 6,820 to 11,650 feet
 Precipitation: 16 to 37 inches
 Average annual air temperature: 35 to 43 degrees F.
 Frost free period: 30 to 60 days
 Parent material and geology: Colluvium from quartzite

Composition

Percent of survey area: 33 percent
 Xeric Haplocryepts—29 percent
 Lamellic Haplocryepts—18 percent
 Pachic Haplocryolls—17 percent
 Lithic Haplocryolls—15 percent
 Minor components—21 percent

Soil Properties

Xeric Haplocryepts (Keyole and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the surface: Plant material

Texture of the mineral soil surface: Extremely gravelly sandy loam

Texture of the subsoil: Extremely gravelly sandy loam or extremely gravelly coarse sandy loam

Texture of the substratum: Gravel

Depth to bedrock: Greater than 60 inches

Slope: 15 to 75 percent

Lamellic Haplocryepts (Osditch and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the surface: Slightly decomposed plant material

Texture of the mineral soil surface: Extremely stony loam

Texture of the subsoil: Extremely stony sandy loam, extremely cobbly sandy loam or extremely cobbly loam

Texture of the substratum: Extremely stony sandy loam, extremely cobbly sandy loam or extremely cobbly loam

Depth to bedrock: Greater than 60 inches

Slope: 30 to 75 percent

Pachic Haplocryolls (Badhap and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the surface: Very gravelly loam

Texture of the subsoil: Very gravelly loam or extremely cobbly loam

Texture of the substratum: Extremely gravelly loam or extremely cobbly loam

Depth to bedrock: Greater than 60 inches

Slope: 15 to 75 percent

Lithic Haplocryolls (Topeki and similar soils)

Depth class: Shallow

Drainage class: Well drained

Texture of the surface layer: Extremely gravelly loam

Texture of the substratum: Extremely stony loam or extremely cobbly loam

Depth to hard bedrock: 10 to 20 inches

Slope: 8 to 75 percent

Use and Management

Major concerns: Most of the area was formerly used for livestock grazing and is currently used for wildlife habitat and recreation

Main management concerns: Steep slopes, cold temperatures, and areas of shallow soils

8. Lithic Cryorthents-Xeric Calcicryolls- Xeric Calcicryepts

(fig. 5)

Shallow to very deep, well drained, cryic soils formed in residuum and colluvium from limestone on high elevation mountains. Vegetation consists of, mountain big sagebrush, curlleaf mountainmahogany, quaking aspen, white fir, bristlecone pine, and Engelmann's spruce.

Setting

Landform: Mountains

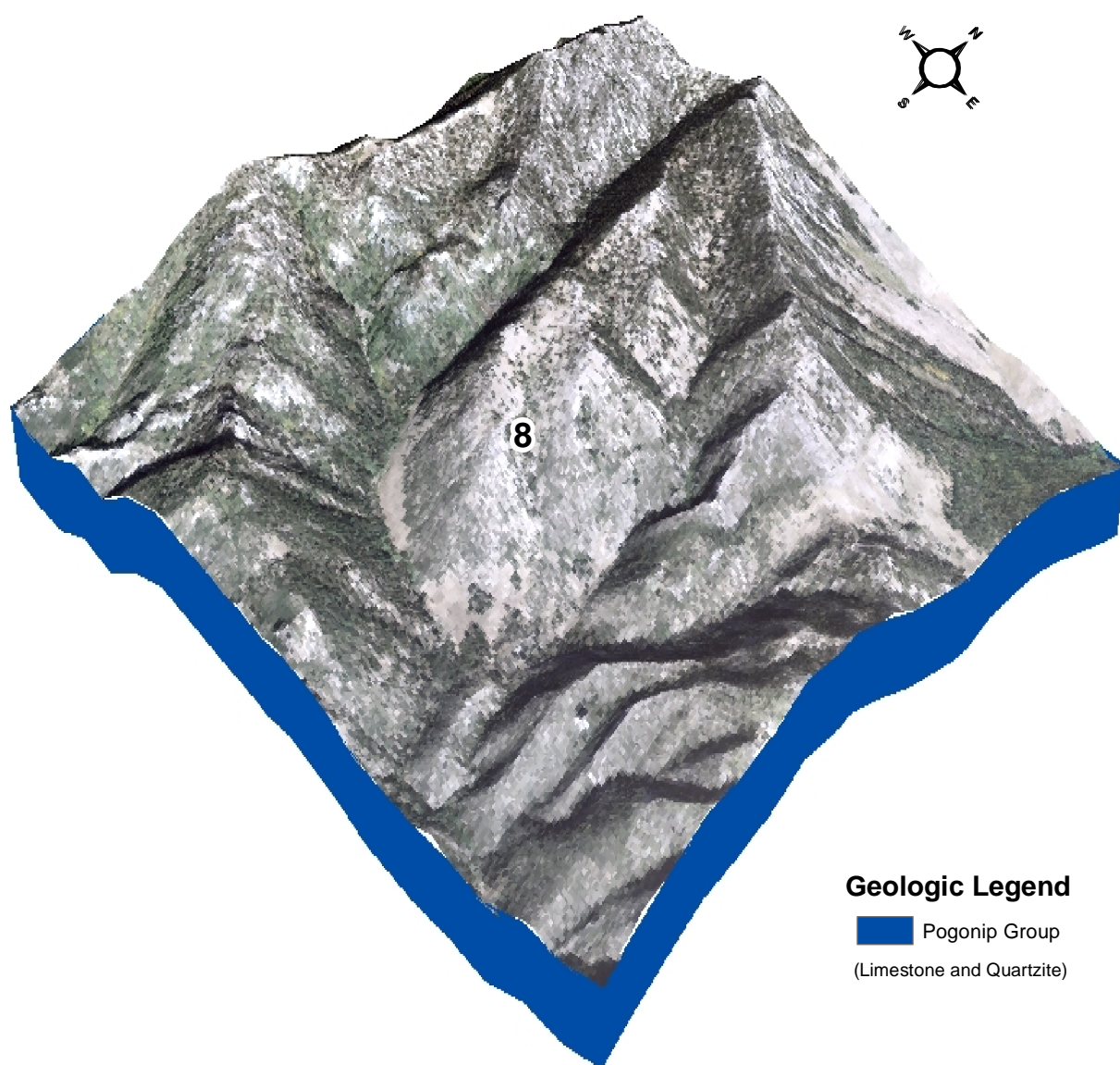


Figure 5 - General soil map unit 8 is extensive in the southern portion of Great Basin National Park. It is on high elevation mountains dominated by calcareous parent material. (View is toward Granite Peak.)

Slope range: 4 to 75 percent

Elevation: 7,220 to 11,680 feet

Precipitation: 18 to 37 inches

Average annual air temperature: 35 to 43 degrees F.

Frost free period: 30 to 60 days

Parent material and geology: Residuum and colluvium from limestone and dolomite

Composition

Percent of survey area: 2 percent

Lithic Cryorthents—33 percent

Xeric Calcicryolls—22 percent

Xeric Calcicryepts—22 percent

Xeric Calcicryepts, deep—10 percent

Rock outcrop—10 percent

Minor components—3 percent

Soil Properties

Lithic Cryorthents (Bricone and similar soils)

Depth class: Shallow

Drainage class: Well drained

Texture of the surface: Very gravelly fine sandy loam

Texture of the subsoil: Extremely gravelly fine sandy loam, very gravelly loam, or very gravelly sandy loam

Depth to bedrock: 10 to 20 inches

Slope: 15 to 75 percent

Xeric Calcicryolls (Canyoung and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the surface: Extremely gravelly loam

Texture of the subsoil: Extremely gravelly loam

Depth to bedrock: Greater than 60 inches

Slope: 4 to 75 percent

Xeric Calcicryepts (Bakerpeak and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the surface: Slightly decomposed plant material

Texture of the mineral soil surface: Very gravelly loam

Texture of the subsoil: Extremely gravelly loam, very gravelly loam, or very gravelly sandy loam

Texture of the substratum: Extremely gravelly loam, extremely gravelly sandy loam, or very gravelly sandy loam

Depth to bedrock: Greater than 60 inches

Slope: 30 to 75 percent

Xeric Calcicryepts, deep (Piar and similar soils)

Depth class: Deep

Drainage class: Well drained

Texture of the surface: Slightly decomposed plant material

Texture of the mineral soil surface: Very gravelly loam

Texture of the subsoil: Extremely gravelly loam or very gravelly loam

Texture of the substratum: Extremely gravelly loam, very gravelly loam, extremely gravelly fine sandy loam, very gravelly fine sandy loam, extremely gravelly sandy loam, or very gravelly sandy loam

Depth to bedrock: 40 to 60 inches

Slope: 30 to 75 percent

Major concerns: Most of the area was formerly used for livestock grazing and is currently used for wildlife habitat and recreation

Main management concerns: Steep slopes, cold temperatures, and areas of shallow soils

9. Pachic Haplocryolls-Lamellic Haplocryalfs-Pachic Haplocryolls

Shallow to very deep, well drained, cryic soils formed in residuum and colluvium from granite on high elevation mountains. Vegetation consists of, mountain big sagebrush, curleaf mountainmahogany, quaking aspen, and Engelmann's spruce.

Setting

Landform: Mountains

Slope range: 15 to 75

Elevation: 7,120 to 11,500 feet

Precipitation: 18 to 37 inches

Average annual air temperature: 35 to 43 degrees F.

Frost free period: 30 to 60 days

Parent material and geology: Residuum and/or colluvium from granite

Composition

Percent of survey area: 8 percent

*Pachic Haplocryolls—*37 percent

*Lamellic Haplocryalfs—*33 percent

*Pachic Haplocryolls, shallow—*26 percent

*Minor components—*4 percent

Soil Properties

Pachic Haplocryolls (Goodski and similar soils)

Depth class: Moderately deep

Drainage class: Well drained

Texture of the soil surface: Very gravelly loam

Texture of the subsurface: Very gravelly coarse sandy loam

Texture of the subsoil: Very gravelly coarse sandy loam

Depth to soft bedrock: 20 to 38 inches

Depth to hard bedrock: 21 to 40 inches

Slope: 15 to 75 percent

Lamellic Haplocryalfs (Ceebee and similar soils)

Depth class: Very deep

Drainage class: Somewhat excessively drained

Texture of the surface: Slightly decomposed plant material

Texture of the mineral soil surface: Very stony highly organic loam

Texture of the subsoil: Extremely stony loamy coarse sand

Texture of the substratum: Extremely gravelly loamy coarse sand or very cobbly coarse sandy loam

Depth to bedrock: Greater than 60 inches

Slope: 30 to 75 percent

Pachic Haplocryolls, shallow (Kiious and similar soils)

Depth class: Shallow

Drainage class: Well drained

Texture of the soil surface: Extremely gravelly loamy coarse sand

Texture of the subsoil: Very gravelly coarse sandy loam, very gravelly loamy coarse sand, or extremely gravelly coarse sandy loam

Depth to soft bedrock: 16 to 20 inches

Depth to hard bedrock: 20 to 30 inches

Use and Management

Major concerns: Most of the area was formerly used for livestock grazing and is currently used for wildlife habitat and recreation

Main management concerns: Steep slopes, cold temperatures, and areas of shallow soils

10. Lamellic Dystrocryepts-Oxyaquic Haplocryepts-Xeric Haplocryolls

Very deep, well drained, cryic soils formed in glacial till dominantly from quartzite on high elevation moraines on mountains. Vegetation consists of mountain big sagebrush, quaking aspen, and Engelmann's spruce.

Setting

Landform: Mountains

Slope range: 8 to 50 percent

Elevation: 7,810 to 11,250 feet

Precipitation: 24 to 37 inches

Average annual air temperature: 35 to 39 degrees F.

Frost free period: 30 to 60 days

Parent material and geology: Till from quartzite and granite

Composition

Percent of survey area: 7 percent

Lamellic Dystrocryepts—42 percent

Oxyaquic Haplocryepts—30 percent

Xeric Haplocryolls—25 percent

Minor components—4 percent

Soil Properties

Lamellic Dystrocryepts (Jumble and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the surface: Slightly decomposed plant material

Texture of the mineral soil surface: Extremely stony loam

Texture of the subsoil: Extremely cobbly sandy loam, extremely stony sandy loam, or very stony sandy loam

Texture of the substratum: Extremely cobbly sandy loam, extremely stony sandy loam or very stony sandy loam

Depth to bedrock: Greater than 60 inches

Slope: 8 to 50 percent

Oxyaquic Haplocryepts (Lemcave and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the surface: Plant material

Texture of the mineral soil surface: Extremely gravelly sandy loam

Texture of the subsoil: Extremely cobbly loamy coarse sand, extremely cobbly coarse sandy loam, or very cobbly coarse sandy loam

Substratum: Extremely gravelly loamy coarse sand, extremely cobbly loamy coarse sand, or very cobbly loamy coarse sand

Depth to bedrock: Greater than 60 inches

Slope: 8 to 50 percent

Xeric Haplocryolls (Gaia and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the soil surface: Extremely gravelly loam

Texture of the subsoil: Extremely cobbly sandy loam or extremely gravelly sandy loam

Depth to bedrock: Greater than 60 inches

Slope: 15 to 50 percent

Use and management

Major concerns: Most of the area was formerly used for livestock grazing and is currently used for wildlife habitat and recreation

Main management concerns: Steep slopes, cold temperatures, and areas of shallow soils

11. Rubble land-Lithic Cryorthents-Xeric Haplocryolls

(fig. 6)

Shallow to very deep, well drained, cryic soils formed in residuum and colluvium from quartzite and limestone on high elevation mountains. Vegetation consists of alpine tundra community.

Setting

Landform: Mountains

Slope range: 8 to 75

Elevation: 9,100 to 13,060 feet

Precipitation: 20 to 37 inches

Average annual air temperature: 32 to 38 degrees F.

Frost free period: 20 to 40 days

Parent material and geology: Colluvium and residuum from quartzite or limestone

Composition

Percent of survey area: 9 percent

Rubble land—27 percent

Lithic Cryorthents—23 percent

Xeric Haplocryolls—19 percent

Xeric Calcicryepts—15 percent

Lithic Cryorthents, carbonatic—11 percent

Minor components—5 percent

Soil Properties

Rubble land

Lithic Cryorthents (Wheelerpek and similar soils)

Depth class: Shallow

Drainage class: Well drained

Texture of the soil surface: Extremely stony loam

Texture of the subsoil: Extremely cobbly sandy loam or extremely cobbly loam

Depth to hard bedrock: 10 to 20 inches

Slope: 30 to 75 percent

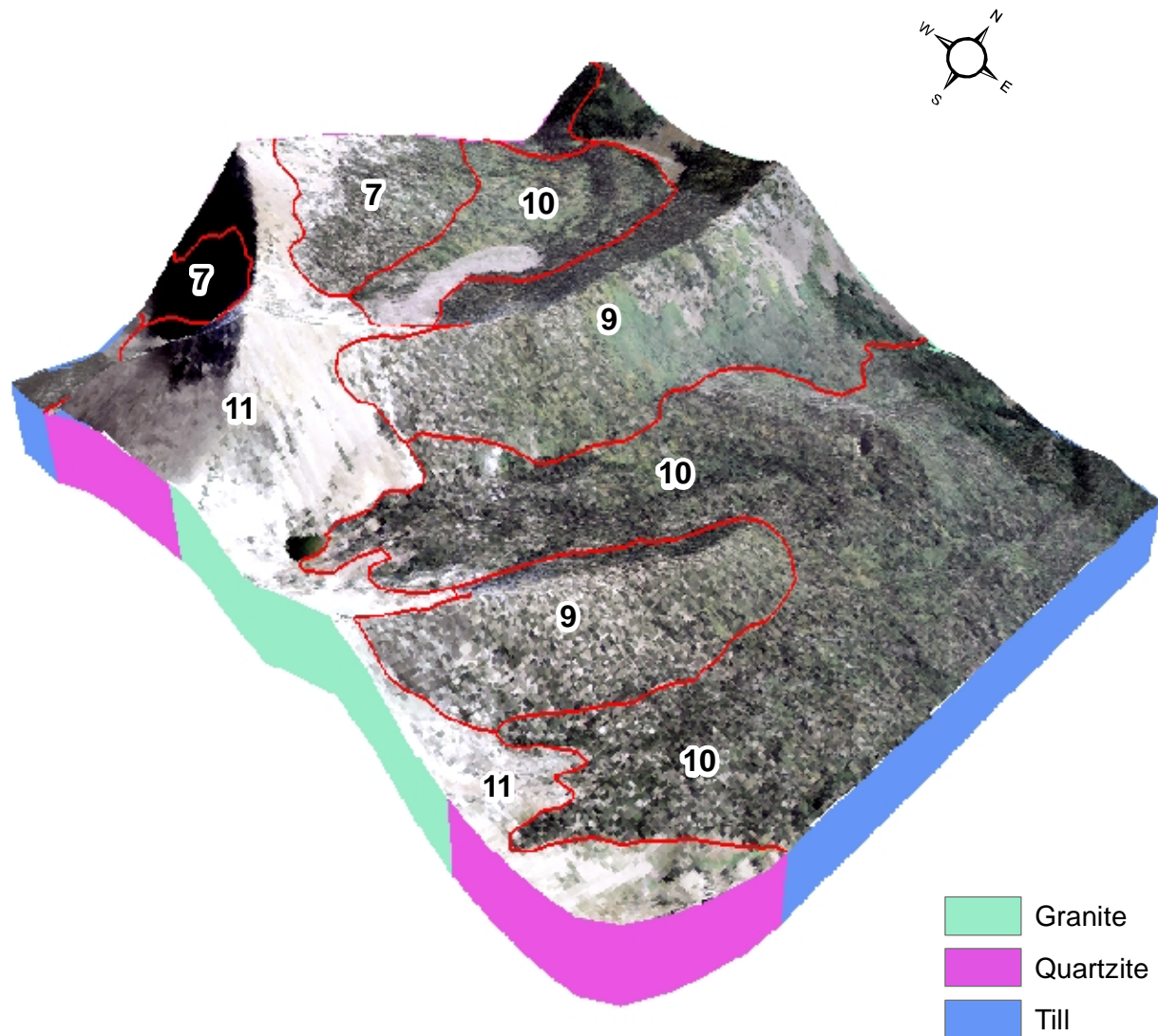


Figure 6 - The pattern of general soil map units at the top of the Snake Creek watershed near Pyramid Peak. General soil map unit 11 is at the highest elevations with dominantly alpine vegetation. General soil map units 7, on high elevation quartzite mountains, and 9, on high elevation granitic mountains, border unit 11. General soil map unit 10 is on the areas of till.

Xeric Haplocryolls (Cobblywheel and similar soils)

Depth class: Very deep

Drainage class: Well drained

Texture of the soil surface: Extremely cobbly highly decomposed plant material

Texture of the mineral soil surface: Extremely cobbly loam

Texture of the subsoil: Extremely cobbly loam

Texture of the substratum: Extremely cobbly loam or extremely cobbly sandy loam

Depth to bedrock: Greater than 60 inches

Slope: 15 to 50 percent

Xeric Calcicryepts (Windwash and similar soils)

Depth class: Moderately deep

Drainage class: Well drained

Texture of the soil surface: Extremely gravelly loamy coarse sand

Texture of the subsoil: Extremely gravelly sandy loam, extremely gravelly fine sandy loam or extremely gravelly loam

Texture of the substratum: Extremely gravelly sandy loam, extremely gravelly fine sandy loam or extremely gravelly loam

Depth to hard bedrock: 20 to 40 inches

Slope: 8 to 50 percent

Lithic Cryorthents, carbonatic (Bricone and similar soils)

Depth class: Shallow

Drainage class: Well drained

Texture of the soil surface: Very gravelly fine sandy loam

Texture of the subsoil: Extremely gravelly fine sandy loam, extremely gravelly sandy loam, very gravelly fine sandy loam, very gravelly sandy loam, very gravelly loam or extremely gravelly loam

Depth to hard bedrock: 10 to 20 inches

Slope: 15 to 75 percent

Use and Management

Major concerns: Most of the area was formerly used for livestock grazing and is currently used for wildlife habitat and recreation

Main management concerns: Steep slopes and areas of shallow soils

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kind of soils or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas. Additional information about managing individual map units is provided in the following sections and associated tables in this publication: Rangeland and Forestland Management, and Soil Properties

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses. Major Land Resource Area (MLRA), is identified for each soil map unit. MLRA's are geographically associated land resource units. All soil map units in this area are within MLRA 28A—Great Salt Lake Area. MLRA 28A is the farthest eastern extent of the Great Basin Section, of the Basin and Range Province, of the Intermontane Plateaus. An area of nearly level basins between widely separated mountain ranges trending north to south. Mountains are typically uplifted fault blocks with steep sideslopes, (USDA, 2006).

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Wayhigh gravelly loam, 2 to 15 percent slopes is a phase of the Wayhigh series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or associations or unidentified groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. There are no complexes used in this survey.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Bellenmine-Basinpeak association is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. There are no undifferentiated groups used in this survey area.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Table 4, "Acreage and Proportionate Extent of the Soils" lists the map units in this survey area. Other tables give properties of the soils and limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing soils.

Some map units used in this survey are delineated by line segments or by points, rather than by the more traditional soil polygons. These map units are developed to locate areas of significant soils and ecological sites that are too small or too narrow to delineate as polygonal features at the scale of mapping. The line segments or points have map unit labels connected by a leader on the finished maps. The amount of information gathered and reported is similar to that provided for other soil map units in the area.

Map Unit Descriptions

1650—Noski-Cedarcabin association

Map Unit Setting

MLRA: 28A

Landscape: Fan piedmont

Elevation: 6,820 to 7,350

Precipitation: 16 to 20 inches

Air temperature: 39 to 43 degrees Fahrenheit

Frost-free period: 40 to 70 days

Composition

Noski gravelly loam, 30 to 75 percent slopes—35 percent

Cedarcabin gravelly loam, 15 to 50 percent slopes—25 percent

Noski gravelly loam, 8 to 30 percent slopes—25 percent

Rock outcrop, 15 to 50 percent slopes—5 percent

Chainlink gravelly loam, 8 to 30 percent slopes—4 percent

Monarch very cobbly sandy loam, 15 to 50 percent slopes—3 percent

Canyonfork very gravelly fine sandy loam, 4 to 15 percent slopes—3 percent

Component Description

Noski and similar soils

Landform: Backslopes of fan remnants

Slope: 30 to 75 percent, all aspects

Parent material: Colluvium and residuum weathered from fanglomerate

Typical vegetation: Indian ricegrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, black sagebrush, Stansbury cliffrose, other shrubs, singleleaf pinyon

Typical profile:

Surface rock fragments: About 5 percent rounded stones, 10 percent rounded cobbles, 50 percent rounded gravel

Layer 1—0 to 2 inches; gravelly loam

Layer 2—2 to 7 inches; very gravelly loam

Layer 3—7 to 15 inches; extremely gravelly sandy loam

Layer 4—15 to 25 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 14 to 20 inches

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 1.1 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7e

Ecological site: R028AY102NV—Shallow Calcareous Hill 10-14 P.Z.

Component Description

Cedarcabin and similar soils

Landform: Backslopes of fan remnants

Slope: 15 to 50 percent, west to east aspects

Parent material: Colluvium and residuum weathered from fanglomerate

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—bottlebrush squirreltail, muttongrass, Sandberg bluegrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, black sagebrush, wild crab apple, Stansbury cliffrose, other shrubs, Utah juniper, singleleaf pinyon, curlleaf mountainmahogany, Indian ricegrass

Site index: Utah juniper—45 at an age base of 100 years

Site index: Singleleaf pinyon—45 at an age base of 100 years

Typical profile:

Surface rock fragments: About 40 percent rounded gravel, 10 percent rounded cobbles, 5 percent rounded stones

Layer 1—0 to 3 inches; gravelly loam

Layer 2—3 to 9 inches; very gravelly loam

Layer 3—9 to 31 inches; extremely gravelly sandy clay loam

Layer 4—31 to 35 inches; bedrock

Layer 5—35 to 37 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Paralithic bedrock: 20 to 36 inches; Lithic bedrock: 23 to 39 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderately Slow)

Available water capacity: About 2 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY074NV

Component Description

Noski and similar soils

Landform: Fan remnants

Slope: 8 to 30 percent, all aspects

Parent material: Colluvium and residuum weathered from fanglomerate

Typical vegetation: Indian ricegrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, black sagebrush, Stansbury cliffrose, other shrubs, singleleaf pinyon

Typical profile:

Surface rock fragments: About 10 percent rounded cobbles, 50 percent rounded gravel, 5 percent rounded stones

Layer 1—0 to 2 inches; gravelly loam

Layer 2—2 to 7 inches; very gravelly loam

Layer 3—7 to 15 inches; extremely gravelly sandy loam

Layer 4—15 to 25 inches; bedrock

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 14 to 20 inches

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderate)

Available water capacity: About 1.1 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7e

Ecological site: R028AY102NV—Shallow Calcareous Hill 10-14 P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Rock outcrop

Composition: 0 to 5 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of mountains

Ecological site: None

Chainlink and similar soils

Composition: 0 to 4 percent

Slope: 8 to 30 percent, all aspects

Landform: Ballenas

Typical vegetation: Other perennial forbs, Indian ricegrass, bluebunch wheatgrass, needleandthread, black sagebrush, other shrubs, Stansbury cliffrose

Ecological site: R028AY034NV—Shallow Calcareous Slope 10-14 P.Z.

Monarch and similar soils

Composition: 0 to 3 percent

Slope: 15 to 50 percent, west to east aspects

Landform: Backslopes of fan remnants

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—muttongrass, other perennial grasses, bluebunch wheatgrass, Utah serviceberry, snowberry, antelope bitterbrush, curlleaf mountainmahogany, basin wildrye, other perennial forbs, mountain big sagebrush, other shrubs

Ecological site: F028AY077NV

Canyonfork and similar soils

Composition: 0 to 3 percent

Slope: 4 to 15 percent, all aspects

Landform: Young alluvial fans

Typical vegetation: Other shrubs, Stansbury cliffrose, wild crab apple, black sagebrush, other perennial forbs, bluebunch wheatgrass, other perennial forbs, needleandthread, Indian ricegrass

Ecological site: R028AY087NV—Calcareous Fan Piedmont 10-14 P.Z.

1652—Noski-Canyonfork-Cedarcabin association

Map Unit Setting

MLRA: 28A

Landscape: Fan piedmont

Elevation: 6,460 to 7,580

Precipitation: 16 to 20 inches

Air temperature: 39 to 43 degrees Fahrenheit

Frost-free period: 40 to 70 days

Composition

Noski gravelly loam, 15 to 50 percent slopes—35 percent

Canyonfork very gravelly fine sandy loam, 4 to 15 percent slopes—30 percent

Cedarcabin gravelly loam, 15 to 30 percent slopes—25 percent

Ravendog loam, 2 to 8 percent slopes—7 percent

Rock outcrop, 15 to 50 percent slopes—3 percent

Component Description

Noski and similar soils

Landform: Fan remnants

Slope: 15 to 50 percent, all aspects

Parent material: Colluvium and residuum weathered from fanglomerate

Typical vegetation: Other perennial grasses, bluebunch wheatgrass, other perennial forbs, black sagebrush, Stansbury cliffrose, other shrubs, singleleaf pinyon, Indian ricegrass

Typical profile:

Surface rock fragments: About 5 percent rounded stones, 10 percent rounded cobbles, 50 percent rounded gravel

Layer 1—0 to 2 inches; gravelly loam

Layer 2—2 to 7 inches; very gravelly loam

Layer 3—7 to 15 inches; extremely gravelly sandy loam

Layer 4—15 to 25 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 14 to 20 inches

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately Rapid)

Available water capacity: About 1.1 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7e

Ecological site: R028AY102NV—Shallow Calcareous Hill 10-14 P.Z.

Component Description

Canyonfork and similar soils

Landform: Young alluvial fans

Slope: 4 to 15 percent, all aspects

Parent material: Alluvium derived from fanglomerate, limestone, dolomite, and quartzite

Typical vegetation: Other perennial forbs, needleandthread, Indian ricegrass, bluebunch wheatgrass, other perennial forbs, black sagebrush, wild crab apple, Stansbury cliffrose, other shrubs

Typical profile:

Surface rock fragments: About 10 percent rounded cobbles, 70 percent rounded gravel

Layer 1—0 to 8 inches; very gravelly fine sandy loam

Layer 2—8 to 60 inches; extremely gravelly fine sandy loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: Rare

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY087NV—Calcareous Fan Piedmont 10-14 P.Z.

Component Description

Cedarcabin and similar soils

Landform: Backslopes of fan remnants

Slope: 15 to 30 percent, northwest to east aspects

Parent material: Colluvium and residuum weathered from fanglomerate

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—bottlebrush squirreltail, muttongrass, Sandberg bluegrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, other shrubs, wild crab apple, black sagebrush, curlleaf mountainmahogany, Stansbury cliffrose, Utah juniper, singleleaf pinyon, Indian ricegrass

Site index: Utah juniper—45 at an age base of 100 years

Site index: Singleleaf pinyon—45 at an age base of 100 years

Typical profile:

Surface rock fragments: About 5 percent rounded stones, 10 percent rounded cobbles, 40 percent rounded gravel

Layer 1—0 to 3 inches; gravelly loam

Layer 2—3 to 9 inches; very gravelly loam

Layer 3—9 to 31 inches; extremely gravelly sandy clay loam

Layer 4—31 to 35 inches; bedrock

Layer 5—35 to 37 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Paralithic bedrock: 20 to 36 inches; Lithic bedrock: 23 to 39 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderately Slow)

Available water capacity: About 2 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY074NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Ravendog and similar soils

Composition: 0 to 7 percent

Slope: 2 to 8 percent, all aspects

Landform: Inset fans

Typical vegetation: Other perennial grasses, basin wildrye, needleandthread, thickspike wheatgrass, other perennial forbs, other shrubs, basin big sagebrush

Ecological site: R028AY091NV—Loamy Fan 10-14 P.Z.

Rock outcrop

Composition: 0 to 3 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of fan remnants

Ecological site: None

1700—Eenreed-Millan association*Map Unit Setting*

MLRA: 28A

Landscape: Fan piedmont

Elevation: 6,590 to 7,510

Precipitation: 12 to 18 inches

Air temperature: 43 to 45 degrees Fahrenheit

Frost-free period: 70 to 100 days

Composition

Eenreed very gravelly loam, 4 to 15 percent slopes—40 percent

Millan very gravelly loam, 15 to 50 percent slopes—30 percent

Eenreed very gravelly loam, 15 to 50 percent slopes—15 percent
 Amtoft very gravelly loam, 15 to 50 percent slopes—4 percent
 Borvant extremely gravelly loam, 4 to 30 percent slopes—3 percent
 Jericho very gravelly loam, 15 to 30 percent slopes—3 percent
 Badena extremely stony sandy loam, 2 to 8 percent slopes—3 percent
 Basinpeak very gravelly loam, 15 to 50 percent slopes—2 percent

Component Description

Eenreed and similar soils

Landform: Backslopes of fan remnants

Slope: 4 to 15 percent, east to northwest aspects

Parent material: Alluvium derived from quartzite, shale and limestone

Typical vegetation: Black sagebrush, Stansbury cliffrose, other shrubs, other perennial forbs, bluebunch wheatgrass, muttongrass, needleandthread, Indian ricegrass (Fig. 7)



Figure 7 —Eenreed soil on fan remnants is dominated by black sagebrush, bluebunch wheatgrass, and Indian ricegrass. Pinyon and juniper often increase on the site.

Typical profile:

Surface rock fragments: 1 percent rounded stones, 80 percent rounded gravel

Layer 1—0 to 5 inches; very gravelly loam

Layer 2—5 to 12 inches; very gravelly loam

Layer 3—12 to 60 inches; extremely gravelly sandy loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY043NV—Shallow Calcareous Loam 10-14 P.Z.

Component Description

Millan and similar soils

Landform: Backslopes of fan remnants

Slope: 15 to 50 percent, northwest to east aspects

Parent material: Alluvium derived dominantly from quartzite with minor amounts of limestone and granite

Typical vegetation: Mountain big sagebrush, other perennial forbs, bluebunch wheatgrass, other perennial grasses, muttongrass, Indian ricegrass, other shrubs

Typical profile:

Surface rock fragments: About 75 percent rounded gravel, 1 percent rounded cobbles, 1 percent rounded stones

Layer 1—0 to 6 inches; very gravelly loam

Layer 2—6 to 16 inches; extremely gravelly clay loam

Layer 3—16 to 60 inches; extremely gravelly sandy loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderately slow)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY064NV—Shallow Loam 10-14 P.Z.

Component Description

Eenreed and similar soils

Landform: Summits of fan remnants

Slope: 15 to 50 percent, east to northwest aspects

Parent material: Alluvium derived from quartzite, shale and limestone

Typical vegetation: Needleandthread, other shrubs, Stansbury cliffrose, black sagebrush, other perennial forbs, bluebunch wheatgrass, Indian ricegrass

Typical profile:

Surface rock fragments: About 1 percent rounded stones, 80 percent rounded gravel

Layer 1—0 to 5 inches; very gravelly loam

Layer 2—5 to 12 inches; very gravelly loam

Layer 3—12 to 60 inches; extremely gravelly sandy loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY034NV—Shallow Calcareous Slope 10-14 P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Amtoft and similar soils

Composition: 0 to 4 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of upper fan remnants

Typical vegetation: Other shrubs, bluebunch wheatgrass, Stansbury cliffrose, black sagebrush, other perennial forbs, needleandthread, Indian ricegrass

Ecological site: R028AY034NV—Shallow Calcareous Slope 10-14 P.Z.

Borvant and similar soils

Composition: 0 to 3 percent

Slope: 4 to 30 percent, all aspects

Landform: Fan remnants

Typical vegetation: Bluebunch wheatgrass, muttongrass, black sagebrush, Stansbury cliffrose, other shrubs, needleandthread, other perennial forbs, Indian ricegrass

Ecological site: R028AY043NV—Shallow Calcareous Loam 10-14 P.Z.

Jericho and similar soils

Composition: 0 to 3 percent

Slope: 15 to 30 percent, all aspects

Landform: Backslopes of upper partial ballenas

Typical vegetation: Shadscale, winterfat, black sagebrush, other perennial forbs, other perennial grasses, Sandberg bluegrass, galleta, needleandthread, Indian ricegrass, other shrubs

Ecological site: R028AY004NV—Shallow Calcareous Slope 8-10 P.Z.

Badena and similar soils

Composition: 0 to 3 percent

Slope: 2 to 8 percent, all aspects

Landform: Upper fan remnants

Typical vegetation: Needleandthread, Indian ricegrass, other shrubs, Wyoming big sagebrush, other perennial forbs, bluebunch wheatgrass, Thurber needlegrass, other perennial grasses

Ecological site: R028AY095NV—Loamy 10-12 P.Z.

Basinpeak and similar soils

Composition: 0 to 2 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Needlegrass, other perennial grasses, bluebunch wheatgrass, muttongrass, low sagebrush, other shrubs, other perennial forbs

Ecological site: R028AY061NV—Claypan 14+ P.Z.

1900—Borvant extremely gravelly loam, 4 to 30 percent slopes*Map Unit Setting*

MLRA: 28A

Landscape: Fan piedmont

Elevation: 6,200 to 7,610

Precipitation: 12 to 16 inches

Air temperature: 45 to 48 degrees Fahrenheit

Frost-free period: 90 to 110 days

Composition

Borvant extremely gravelly loam, 4 to 30 percent slopes—90 percent

Badena extremely stony sandy loam, 2 to 8 percent slopes—5 percent

Closkey very gravelly loamy coarse sand, 4 to 30 percent slopes—3 percent

Ripcon gravelly loam, 2 to 15 percent slopes—2 percent

Component Description

Borvant and similar soils

Landform: Fan remnants

Slope: 4 to 30 percent, all aspects

Parent material: Alluvium and colluvium derived from limestone

Typical vegetation: Needleandthread, other shrubs, Stansbury cliffrose, black sagebrush, other perennial forbs, bluebunch wheatgrass, muttongrass, Indian ricegrass

Typical profile:

Layer 1—0 to 8 inches; extremely gravelly loam

Layer 2—8 to 14 inches; extremely gravelly loam

Layer 3—14 to 25 inches; cemented material

Layer 4—25 to 60 inches; extremely gravelly loamy sand

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Petrocalcic: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.0 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY043NV—Shallow Calcareous Loam 10-14 P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Badena and similar soils

Composition: 0 to 5 percent

Slope: 2 to 8 percent, all aspects

Landform: Upper fan remnants

Typical vegetation: Indian ricegrass, other perennial grasses, Thurber needlegrass, bluebunch wheatgrass, other perennial forbs, Wyoming big sagebrush, other shrubs, needleandthread

Ecological site: R028AY095NV—Loamy 10-12 P.Z.

Closkey and similar soils

Composition: 0 to 3 percent

Slope: 4 to 30 percent, all aspects

Landform: Fan remnants

Typical vegetation: Thurber needlegrass, bluegrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, antelope bitterbrush, other shrubs

Ecological site: R028AY066NV—Gravelly Loam 12-14 P.Z.

Ripcon and similar soils

Composition: 0 to 2 percent

Slope: 2 to 15 percent, all aspects

Landform: Drainageways

Typical vegetation: Forest canopy—narrowleaf cottonwood Forest understory—slender wheatgrass, sedge, basin wildrye, bluegrass, other perennial grasses, other perennial forbs, skunkbush sumac, willow, other shrubs, water birch, rush, narrowleaf cottonwood

Ecological site: F028AY079NV

2000—Closkey very gravelly loamy coarse sand, 4 to 30 percent slopes

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 6,400 to 8,730

Precipitation: 16 to 20 inches

Air temperature: 39 to 43 degrees Fahrenheit

Frost-free period: 40 to 70 days

Composition

Closkey very gravelly loamy coarse sand, 4 to 30 percent slopes—85 percent

Badhap very gravelly loam, 15 to 30 percent slopes—6 percent

Borvant extremely gravelly loam, 4 to 30 percent slopes—4 percent

Kious extremely gravelly loamy coarse sand, 30 to 50 percent slopes—3 percent

Basinpeak very gravelly loam, 15 to 50 percent slopes—2 percent

Component Description

Closkey and similar soils

Landform: Rock pediments

Slope: 4 to 30 percent, all aspects

Parent material: Colluvium and residuum derived from granite

Typical vegetation: Other perennial grasses, Thurber needlegrass, other shrubs, bluegrass, bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, antelope bitterbrush (Fig. 8)

Typical profile:

Surface rock fragments: About 35 percent angular gravel

Layer 1—0 to 8 inches; very gravelly loamy coarse sand

Layer 2—8 to 16 inches; very gravelly sandy loam

Layer 3—16 to 26 inches; very gravelly sandy clay loam

Layer 4—26 to 60 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Depth to restrictive feature: Paralithic bedrock: 20 to 39 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)



Figure 8—Typical vegetation on the Closkey soil.

Available water capacity: About 2 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY066NV—Gravelly Loam 12-14 P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Badhap and similar soils

Composition: 0 to 6 percent

Slope: 15 to 30 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Mountain brome, nodding brome, slender wheatgrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, Utah serviceberry, other shrubs, mountain snowberry, needlegrass, mountain big sagebrush

Ecological site: R028AY068NV—Loamy Slope 16+ P.Z.

Borvant and similar soils

Composition: 0 to 4 percent

Slope: 4 to 30 percent, all aspects

Landform: Lower mountains

Typical vegetation: Black sagebrush, bluebunch wheatgrass, needleandthread, Indian ricegrass, other shrubs, other perennial forbs, Stansbury cliffrose

Ecological site: R028AY034NV—Shallow Calcareous Slope 10-14 P.Z.

Kious and similar soils

Composition: 0 to 3 percent

Slope: 30 to 50 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Curlleaf mountainmahogany, needlegrass, mountain big sagebrush, other perennial forbs, bluebunch wheatgrass, other perennial grasses, muttongrass

Ecological site: R028AY059NV—Mahogany Savanna

Basinpeak and similar soils

Composition: 0 to 2 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Other shrubs, low sagebrush, other perennial forbs, bluebunch wheatgrass, muttongrass, other perennial grasses, needlegrass

Ecological site: R028AY061NV—Claypan 14+ P.Z.

2101—Radol-Logring-Rock outcrop association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 6,730 to 9,090

Precipitation: 10 to 14 inches

Air temperature: 45 to 52 degrees Fahrenheit

Frost-free period: 80 to 110 days

Composition

Radol very gravelly loam, 30 to 75 percent slopes—40 percent

Logring extremely gravelly loam, 30 to 75 percent slopes—25 percent

Rock outcrop, 30 to 75 percent slopes—20 percent

Eenreed very gravelly loam, 8 to 30 percent slopes—6 percent

Hopeka very gravelly loam, 30 to 75 percent slopes—5 percent

Canyoung extremely gravelly loam, 15 to 50 percent slopes—3 percent

Ripcon gravelly loam, 2 to 15 percent slopes—1 percent

Component Description

Radol and similar soils

Landform: Mountains

Slope: 30 to 75 percent, east to northwest aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Indian ricegrass, other perennial grasses, black sagebrush, other shrubs, singleleaf pinyon, Stansbury cliffrose, bluebunch wheatgrass, other perennial forbs

Typical profile:

Surface rock fragments: About 30 percent subangular gravel, 2 percent subangular stones, 15 percent subangular cobbles

Layer 1—0 to 2 inches; very gravelly loam

Layer 2—2 to 15 inches; extremely cobbly loam

Layer 3—15 to 25 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 14 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.2 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7e

Ecological site: R028AY102NV—Shallow Calcareous Hill 10-14 P.Z.

Component Description

Logging and similar soils

Landform: Mountains

Slope: 30 to 75 percent, west to east aspects

Parent material: Colluvium and residuum derived from limestone

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—other perennial grasses, singleleaf pinyon, Utah juniper, other shrubs, Stansbury cliffrose, wild crab apple, curleaf mountainmahogany, black sagebrush, other perennial forbs, bluebunch wheatgrass, muttongrass, Sandberg bluegrass, bottlebrush squirreltail, Indian ricegrass

Site index: Utah juniper—45 at an age base of 100 years

Site index: Singleleaf pinyon—45 at an age base of 100 years

Typical profile:

Surface rock fragments: About 10 percent cobbles, 60 percent gravel

Layer 1—0 to 3 inches; extremely gravelly loam

Layer 2—3 to 10 inches; very gravelly loam

Layer 3—10 to 20 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 7 to 14 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.0 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY074NV

Component Description

Rock outcrop

Landform: Backslopes of mountains; summits of mountains

Slope: 30 to 75 percent, all aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Eenreed and similar soils

Composition: 0 to 6 percent

Slope: 8 to 30 percent, east to northwest aspects

Landform: Backslopes of fan remnants

Typical vegetation: Stansbury cliffrose, other shrubs, bluebunch wheatgrass, other perennial forbs, needleandthread, Indian ricegrass, black sagebrush

Ecological site: R028AY034NV—Shallow Calcareous Slope 10-14 P.Z.

Hopeka and similar soils

Composition: 0 to 5 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Other shrubs, black sagebrush, littleleaf mountain mahogany, Stansbury cliffrose, spiny greasebush, Scribner needlegrass, other perennial forbs

Ecological site: R028AY029NV—Limestone Hill

Canyoung and similar soils

Composition: 0 to 3 percent

Slope: 15 to 50 percent, west to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Curleaf mountainmahogany, needlegrass, muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, mountain big sagebrush

Ecological site: R028AY059NV—Mahogany Savanna

Ripcon and similar soils

Composition: 0 to 1 percent

Slope: 2 to 15 percent, all aspects

Landform: Drainageways

Typical vegetation: Forest canopy—narrowleaf cottonwood Forest understory—other perennial grasses, sedge, slender wheatgrass, rush, basin wildrye, bluegrass, other perennial forbs, skunkbush sumac, willow, other shrubs, water birch, narrowleaf cottonwood

Ecological site: F028AY079NV

2103—Radol-Hyzen-Rock outcrop association***Map Unit Setting***

MLRA: 28A

Landscape: Mountains

Elevation: 6,230 to 9,020

Precipitation: 12 to 16 inches

Air temperature: 39 to 50 degrees Fahrenheit

Frost-free period: 70 to 110 days

Composition

Radol very gravelly loam, 30 to 75 percent slopes—40 percent

Hyzen extremely stony loam, 15 to 50 percent slopes—30 percent

Rock outcrop, 50 to 75 percent slopes—20 percent

Grandeposit gravelly loam, 4 to 30 percent slopes—4 percent

Borvant extremely gravelly loam, 4 to 30 percent slopes—3 percent

Ripcon gravelly loam, 2 to 8 percent slopes—2 percent

Osditch extremely stony loam, 30 to 75 percent slopes—1 percent

Component Description

Radol and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, all aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Stansbury cliffrose, singleleaf pinyon, other shrubs, other perennial forbs, bluebunch wheatgrass, other perennial grasses, Indian ricegrass, black sagebrush

Typical profile:

Surface rock fragments: About 30 percent subangular gravel, 15 percent subangular cobbles, 2 percent subangular stones

Layer 1—0 to 2 inches; very gravelly loam

Layer 2—2 to 15 inches; extremely cobbly loam

Layer 3—15 to 25 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 14 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.2 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7e

Ecological site: R028AY102NV—Shallow Calcareous Hill 10-14 P.Z.

Component Description

Hyzen and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, west to east aspects

Parent material: Colluvium and residuum derived from limestone and dolomite

Typical vegetation: Scribner needlegrass, other shrubs, Stansbury cliffrose, spiny greasebush, littleleaf mountain mahogany, black sagebrush, other perennial forbs

Typical profile:

Surface rock fragments: About 20 percent angular stones, 10 percent angular cobbles, 45 percent angular gravel

Layer 1—0 to 2 inches; extremely stony loam

Layer 2—2 to 12 inches; extremely stony loam

Layer 3—12 to 16 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 6 to 14 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 0.8 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY029NV—Limestone Hill

Component Description

Rock outcrop

Landform: Backslopes of mountains

Slope: 50 to 75 percent, all aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Grandeposit and similar soils

Composition: 0 to 4 percent

Slope: 4 to 30 percent, west to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—other perennial grasses, Indian ricegrass, muttongrass, Sandberg bluegrass, bluebunch wheatgrass, other perennial forbs, black sagebrush, curlleaf mountainmahogany, wild crab apple, Stansbury cliffrose, other shrubs, Utah juniper, singleleaf pinyon, bottlebrush squirreltail

Ecological site: F028AY074NV

Borvant and similar soils

Composition: 0 to 3 percent

Slope: 4 to 30 percent, all aspects

Landform: Fan remnants

Typical vegetation: Other shrubs, Stansbury cliffrose, black sagebrush, other perennial forbs, Indian ricegrass, bluebunch wheatgrass, muttongrass, needleandthread

Ecological site: R028AY043NV—Shallow Calcareous Loam 10-14 P.Z.

Ripcon and similar soils

Composition: 0 to 2 percent

Slope: 2 to 8 percent, all aspects

Landform: Drainageways

Typical vegetation: Forest canopy—narrowleaf cottonwood

Forest understory—basin wildrye, water birch, sedge, slender wheatgrass, rush, bluegrass, other perennial grasses, other perennial forbs, skunkbush sumac, willow, other shrubs, narrowleaf cottonwood

Ecological site: F028AY079NV

Osditch and similar soils

Composition: 0 to 1 percent

Slope: 30 to 75 percent, west to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—skyline bluegrass, sedge, other shrubs, Oregon grape, common juniper, other trees, Rocky Mountain Douglas fir, quaking aspen, muttongrass, other perennial grasses, other perennial forbs, mountain snowberry, white fir

Ecological site: F028AY080NV

2111—Garnet-Rock outcrop association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 6,530 to 8,070

Precipitation: 16 to 20 inches

Air temperature: 39 to 43 degrees Fahrenheit

Frost-free period: 40 to 70 days

Composition

Garnel very gravelly coarse sandy loam, 30 to 75 percent slopes—70 percent

Rock outcrop, 30 to 100 percent slopes—25 percent

Closkey very gravelly loamy coarse sand, 4 to 30 percent slopes—5 percent

Component Description

Garnel and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, west to east aspects

Parent material: Colluvium and residuum derived from granite

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—antelope bitterbrush, other shrubs, snowberry, other perennial forbs, bluebunch wheatgrass, other perennial grasses, Utah serviceberry, basin wildrye, mountain big sagebrush, muttongrass, curlleaf mountainmahogany

Site index: Utah juniper—75 at an age base of 100 years

Site index: Singleleaf pinyon—75 at an age base of 100 years

Typical profile:

Surface rock fragments: About 2 percent angular cobbles, 50 percent angular gravel, 1 percent angular stones

Layer 1—0 to 7 inches; very gravelly coarse sandy loam

Layer 2—7 to 12 inches; very gravelly sandy clay loam

Layer 3—12 to 20 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Paralithic bedrock: 10 to 14 inches; Lithic bedrock: 20 to 39 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 0.9 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY077NV

Component Description

Rock outcrop

Landform: Backslopes of mountains

Slope: 30 to 100 percent, all aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Closkey and similar soils

Composition: 0 to 5 percent

Slope: 4 to 30 percent, east to west aspects

Landform: Rock pediments

Typical vegetation: Mountain big sagebrush, Thurber needlegrass, bluegrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, other shrubs, antelope bitterbrush

Ecological site: R028AY066NV—Gravelly Loam 12-14 P.Z.

2430—Bellenmine-Basinpeak association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 7,090 to 8,500

Precipitation: 16 to 28 inches

Air temperature: 37 to 43 degrees Fahrenheit

Frost-free period: 40 to 70 days

Composition

Bellenmine extremely gravelly sandy loam, 8 to 30 percent slopes—70 percent

Basinpeak very gravelly loam, 15 to 50 percent slopes—15 percent

Osditch extremely stony loam, 30 to 75 percent slopes—5 percent

Brokit very stony highly organic loam, 8 to 15 percent slopes—4 percent

Topeki extremely gravelly loam, 15 to 50 percent slopes—4 percent

Rock outcrop, 30 to 75 percent slopes—2 percent

Component Description

Bellenmine and similar soils

Landform: Backslopes of mountains

Slope: 8 to 30 percent, all aspects

Parent material: Colluvium and residuum derived from quartzite

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon (Fig. 9)

Forest understory—Utah serviceberry, other shrubs, white fir, other perennial grasses, bluebunch wheatgrass, muttongrass, singleleaf pinyon, other perennial forbs, Utah juniper, curlleaf mountainmahogany, low sagebrush

Site index: Utah juniper—45 at an age base of 100 years

Site index: Singleleaf pinyon—45 at an age base of 100 years

Typical profile:

Surface rock fragments: About 5 percent angular cobbles, 45 percent angular gravel, 10 percent angular stones

Layer 1—0 to 5 inches; extremely gravelly sandy loam

Layer 2—5 to 18 inches; very gravelly clay loam

Layer 3—18 to 28 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 14 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderately slow)

Available water capacity: About 2 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: F028AY075NV

Component Description

Basinpeak and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, all aspects

Parent material: Colluvium and residuum derived from quartzite and granite

Typical vegetation: Muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, low sagebrush, other shrubs, needlegrass

Typical profile:

Surface rock fragments: About 10 percent stones, 5 percent cobbles, 30 percent gravel

Layer 1—0 to 11 inches; very gravelly loam

Layer 2—11 to 60 inches; extremely gravelly loam



Figure 9 —Singleleaf pinyon and Utah juniper are the dominant trees on the Bellenmine soil.

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY061NV—Claypan 14+ P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Osditch and similar soils

Composition: 0 to 5 percent

Slope: 30 to 75 percent, west to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—other perennial grasses, other trees, Rocky Mountain Douglas fir, quaking aspen, white fir, mountain snowberry, other shrubs, sedge, Oregon grape, common juniper, other perennial forbs, muttongrass, skyline bluegrass

Ecological site: F028AY080NV

Brokit and similar soils

Composition: 0 to 4 percent

Slope: 8 to 15 percent, west to east aspects

Landform: Mountains

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—Nevada bluegrass, skyline bluegrass, other perennial forbs, slender wheatgrass, Engelmann's spruce, other shrubs, other trees, mountain brome, Utah serviceberry, Oregon grape, willow, mountain snowberry, white fir, quaking aspen

Ecological site: F028AY078NV

Topeki and similar soils

Composition: 0 to 4 percent

Slope: 15 to 50 percent, east to west aspects

Landform: Summits of mountains; Shoulders of mountains

Typical vegetation: Letterman needlegrass, bluebunch wheatgrass, mountain big sagebrush, curlleaf mountainmahogany, other perennial forbs

Ecological site: R028AY058NV—Stony Mahogany Savanna

Rock outcrop

Composition: 0 to 2 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Ecological site: None

2432—Majorsplace-Checkett-Grube association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 6,360 to 7,640

Precipitation: 8 to 16 inches

Air temperature: 43 to 52 degrees Fahrenheit

Frost-free period: 70 to 110 days

Composition

Majorsplace very gravelly loam, 8 to 30 percent slopes—40 percent

Checkett extremely gravelly loam, 15 to 50 percent slopes—30 percent

Grube extremely cobbly loam, 15 to 50 percent slopes—15 percent

Rock outcrop, 30 to 50 percent slopes—6 percent

Grandeposit gravelly loam, 15 to 50 percent slopes—4 percent

Tractuff extremely gravelly loam, 30 to 50 percent slopes—3 percent
Rubble land, 30 to 50 percent slopes—2 percent

Component Description

Majorsplace and similar soils

Landform: Mountains

Slope: 8 to 30 percent, west to east aspects

Parent material: Colluvium and residuum weathered from quartzite with minor amounts of calcareous loess

Typical vegetation: Black sagebrush, Indian ricegrass, other perennial grasses, other perennial forbs, bluebunch wheatgrass, singleleaf pinyon, other shrubs, Stansbury cliffrose

Typical profile:

Surface rock fragments: About 10 percent subrounded stones, 20 percent subrounded cobbles, 40 percent subrounded gravel

Layer 1—0 to 7 inches; very gravelly loam

Layer 2—7 to 13 inches; extremely cobbly clay loam

Layer 3—13 to 18 inches; extremely cobbly loam

Layer 4—18 to 28 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 14 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderately Slow)

Available water capacity: About 1.5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY102NV—Shallow Calcareous Hill 10-14 P.Z.

Component Description

Checkett and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, east to west aspects

Parent material: Colluvium and residuum derived from igneous and metamorphic rock

Typical vegetation: Stansbury cliffrose, black sagebrush, other perennial forbs, bluebunch wheatgrass, muttongrass, needleandthread, Indian ricegrass, other shrubs

Typical profile:

Surface rock fragments: About 5 percent angular stones, 20 percent angular cobbles, 45 percent angular gravel

Layer 1—0 to 3 inches; extremely gravelly loam

Layer 2—3 to 10 inches; extremely gravelly clay loam

Layer 3—10 to 17 inches; very gravelly clay loam

Layer 4—17 to 27 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 14 to 20 inches
 Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderately slow)
 Available water capacity: About 2 inches
 Present flooding: None
 Present ponding: None
 Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s
 Ecological site: R028AY043NV—Shallow Calcareous Loam 10-14 P.Z.

Component Description

Grube and similar soils
 Landform: Backslopes of mountains
 Slope: 15 to 50 percent, all aspects
 Parent material: Colluvium derived from quartzite
 Typical vegetation: Muttongrass, other perennial grasses, Indian ricegrass, other perennial forbs, mountain big sagebrush, other shrubs, bluebunch wheatgrass

Typical profile:

Surface rock fragments: About 15 percent subangular gravel, 10 percent subangular stones, 30 percent subangular cobbles
 Layer 1—0 to 5 inches; extremely cobbly loam
 Layer 2—5 to 11 inches; extremely cobbly loam
 Layer 3—11 to 26 inches; extremely cobbly clay loam
 Layer 4—26 to 39 inches; extremely cobbly clay loam
 Layer 5—39 to 60 inches; extremely cobbly loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High
 Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderately slow)
 Available water capacity: About 4 inches
 Present flooding: None
 Present ponding: None
 Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s
 Ecological site: R028AY064NV—Shallow Loam 10-14 P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Rock outcrop
 Composition: 0 to 6 percent
 Slope: 30 to 50 percent, all aspects
 Landform: Backslopes of mountains
 Ecological site: None

Grande deposit and similar soils
 Composition: 0 to 4 percent
 Slope: 15 to 50 percent, all aspects
 Landform: Backslopes of mountains
 Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—black sagebrush, curleaf mountainmahogany, wild crab apple, singleleaf pinyon, other shrubs, Utah juniper, other perennial forbs, other perennial grasses, Sandberg bluegrass, muttongrass, bottlebrush squirreltail, Indian ricegrass, bluebunch wheatgrass, Stansbury cliffrose
Ecological site: F028AY074NV

Tractuff and similar soils

Composition: 0 to 3 percent

Slope: 30 to 50 percent, west to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—singleleaf pinyon

Forest understory—singleleaf pinyon, muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, Utah serviceberry, mountain big sagebrush, other shrubs

Ecological site: F028AY076NV

Rubble land

Composition: 0 to 2 percent

Slope: 30 to 50 percent, all aspects

Landform: Backslopes of mountains

Ecological site: None

3344—Badena association

Map Unit Setting

MLRA: 28A

Landscape: Outwash plain

Elevation: 6,560 to 8,240

Precipitation: 10 to 14 inches

Air temperature: 46 to 48 degrees Fahrenheit

Frost-free period: 90 to 110 days

Composition

Badena extremely stony loam, 4 to 30 percent slopes—60 percent

Badena extremely stony sandy loam, 8 to 30 percent slopes—25 percent

Chainlink gravelly loam, 4 to 8 percent slopes—4 percent

Tractuff extremely gravelly loam, 30 to 50 percent slopes—3 percent

Huilepass extremely gravelly fine sandy loam, 4 to 15 percent slopes—2 percent

Badhap very stony loam, 15 to 50 percent slopes—2 percent

Hackwood gravelly silt loam, 15 to 50 percent slopes—2 percent

Ripcon gravelly loam, 4 to 15 percent slopes—1 percent

Lehmandow loam, 0 to 2 percent slopes—1 percent

Component Description

Badena and similar soils

Landform: Outwash fans

Slope: 4 to 30 percent, all aspects

Parent material: Alluvium derived from quartzite

Typical vegetation: Indian ricegrass, other perennial grasses, muttongrass, bluebunch wheatgrass, other shrubs, mountain big sagebrush, other perennial forbs (Fig. 10)

Typical profile:

Surface rock fragments: About 20 percent cobbles, 35 percent gravel, 5 percent stones

Layer 1—0 to 12 inches; extremely stony loam

Layer 2—12 to 36 inches; extremely stony clay loam

Layer 3—36 to 60 inches; extremely stony coarse sand

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained



Figure 10—This view of the Badena soil shows Utah juniper increasing on the ecological site. This shallow loam 10-14" p.z. ecological site is typically dominated by mountain big sagebrush, bluebunch wheatgrass, and Indian ricegrass.

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY064NV—Shallow Loam 10-14 P.Z.

Component Description

Badena and similar soils

Landform: Outwash fans

Slope: 8 to 30 percent, all aspects

Parent material: Alluvium derived from quartzite

Typical vegetation: Thurber needlegrass, Indian ricegrass, other shrubs, Wyoming big sagebrush, other perennial forbs, bluebunch wheatgrass, needleandthread, other perennial grasses

Typical profile:

Surface rock fragments: About 5 percent stones, 20 percent cobbles, 35 percent gravel

Layer 1—0 to 12 inches; extremely stony sandy loam

Layer 2—12 to 36 inches; extremely stony clay loam

Layer 3—36 to 60 inches; extremely stony coarse sand

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY095NV—Loamy 10-12 P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Chainlink and similar soils

Composition: 0 to 4 percent

Slope: 4 to 8 percent, all aspects

Landform: Fan remnants

Typical vegetation: Indian ricegrass, needleandthread, muttongrass, bluebunch wheatgrass, other perennial forbs, black sagebrush, Stansbury cliffrose, other shrubs

Ecological site: R028AY043NV—Shallow Calcareous Loam 10-14 P.Z.

Tractuff and similar soils

Composition: 0 to 3 percent

Slope: 30 to 50 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—singleleaf pinyon

Forest understory—singleleaf pinyon, other perennial grasses, other shrubs, Utah serviceberry, other perennial forbs, bluebunch wheatgrass, mountain big sagebrush, muttongrass

Ecological site: F028AY076NV

Huilepass and similar soils

Composition: 0 to 2 percent

Slope: 4 to 15 percent, all aspects

Landform: Sideslopes barrier beaches

Typical vegetation: Spiny hopsage, other shrubs, Wyoming big sagebrush, Indian ricegrass, needleandthread, other perennial forbs, other perennial grasses, galleta

Ecological site: R028AY015NV—Loamy 8-10 P.Z.

Badhap and similar soils

Composition: 0 to 2 percent

Slope: 15 to 50 percent, west to east aspects

Landform: Backslopes of mountains

Typical vegetation: Bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, muttongrass, mountain snowberry, other perennial grasses, other shrubs

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Hackwood and similar soils

Composition: 0 to 2 percent

Slope: 15 to 50 percent, west to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—mountain snowberry, other shrubs, Nevada bluegrass, white fir, other perennial grasses, sedge, slender wheatgrass, rush, quaking aspen, skyline bluegrass, other trees, other perennial forbs, willow

Ecological site: F028AY056NV

Ripcon and similar soils

Composition: 0 to 1 percent

Slope: 4 to 15 percent, all aspects

Landform: Drainageways

Typical vegetation: Forest canopy—narrowleaf cottonwood

Forest understory—other perennial grasses, bluegrass, basin wildrye, rush, slender wheatgrass, sedge, other perennial forbs, water birch, other shrubs, willow, skunkbush sumac, narrowleaf cottonwood

Ecological site: F028AY079NV

Lehmandow and similar soils

Composition: 0 to 1 percent

Slope: 0 to 2 percent, all aspects

Landform: Stream terraces

Typical vegetation: Shrubby cinquefoil, sedge, other shrubs, other perennial forbs, other perennial grasses, Nevada bluegrass, alpine timothy, tufted hairgrass

Ecological site: R028AY072NV—Wet Meadow

3439—Eaglepass-Rock outcrop-Amtoft association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 6,200 to 6,360

Precipitation: 8 to 12 inches

Air temperature: 45 to 52 degrees Fahrenheit

Frost-free period: 100 to 120 days

Composition

Eaglepass extremely gravelly loam, 15 to 50 percent slopes—45 percent

Rock outcrop, 15 to 50 percent slopes—25 percent

Amtoft very gravelly loam, 4 to 30 percent slopes—15 percent

Monarch very cobbly sandy loam, 15 to 50 percent slopes—7 percent

Logring extremely gravelly loam, 15 to 50 percent slopes—5 percent

Lodar very gravelly loam, 8 to 30 percent slopes—3 percent

Component Description

Eaglepass and similar soils

Landform: Summits of mountains; Backslopes of mountains; Shoulders of mountains

Slope: 15 to 50 percent, east to northwest aspects

Parent material: Colluvium and residuum derived from limestone and dolomite

Typical vegetation: Stansbury cliffrose, spiny greasebush, littleleaf mountain mahogany, black sagebrush, other perennial forbs, Scribner needlegrass, other shrubs

Typical profile:

Surface rock fragments: About 15 percent angular stones, 10 percent angular cobbles, 60 percent angular gravel

Layer 1—0 to 2 inches; extremely gravelly loam

Layer 2—2 to 6 inches; extremely gravelly loam

Layer 3—6 to 16 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 4 to 6 inches

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 0.3 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY029NV—Limestone Hill

Component Description

Rock outcrop

Landform: Backslopes of mountains

Slope: 15 to 50 percent, all aspects

Component Description

Amtoft and similar soils

Landform: Backslopes of mountains

Slope: 4 to 30 percent, east to northwest aspects

Parent material: Residuum weathered from limestone, sandstone, and shale

Typical vegetation: Bluebunch wheatgrass, other perennial grasses, Indian ricegrass, singleleaf pinyon, other shrubs, Stansbury cliffrose, black sagebrush, other perennial forbs

Typical profile:

Surface rock fragments: About 5 percent angular cobbles, 1 percent angular stones, 55 percent angular gravel

Layer 1—0 to 6 inches; very gravelly loam

Layer 2—6 to 12 inches; very gravelly loam

Layer 3—12 to 16 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.1 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY102NV—Shallow Calcareous Hill 10-14 P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Monarch and similar soils

Composition: 0 to 7 percent

Slope: 15 to 50 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—muttongrass, basin wildrye, mountain big sagebrush, snowberry, antelope bitterbrush, Utah serviceberry, curlleaf mountainmahogany, other shrubs, other perennial grasses, bluebunch wheatgrass, other perennial forbs

Ecological site: F028AY077NV

Logring and similar soils

Composition: 0 to 5 percent

Slope: 15 to 50 percent, all aspects

Landform: Mountains

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—curlleaf mountainmahogany, black sagebrush, other perennial forbs, bluebunch wheatgrass, other perennial grasses, Sandberg bluegrass, Stansbury cliffrose, wild crab apple, muttongrass, Utah juniper, other shrubs, singleleaf pinyon, Indian ricegrass, bottlebrush squirreltail

Ecological site: F028AY074NV

Lodar and similar soils

Composition: 0 to 3 percent

Slope: 8 to 30 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—Stansbury cliffrose, other perennial grasses, bluebunch wheatgrass, other perennial forbs, Sandberg bluegrass, singleleaf pinyon, Indian ricegrass, bottlebrush squirreltail, black sagebrush, curlleaf mountainmahogany, wild crab apple, muttongrass, other shrubs, Utah juniper

Ecological site: F028AY074NV

3900—Osditch extremely stony loam, 30 to 75 percent slopes

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 8,100 to 10,200

Precipitation: 18 to 28 inches

Air temperature: 37 to 43 degrees Fahrenheit

Frost-free period: 40 to 60 days

Composition

Osditch extremely stony loam, 30 to 75 percent slopes—85 percent

Rubble land, 30 to 75 percent slopes—4 percent

Berrycreek very gravelly loam, 15 to 50 percent slopes—3 percent

Jonlake extremely gravelly loam, 8 to 30 percent slopes—3 percent

Topeki extremely gravelly loam, 30 to 50 percent slopes—2 percent

Rock outcrop, 30 to 75 percent slopes—2 percent

Keyole extremely gravelly sandy loam, 30 to 75 percent slopes—1 percent

Component Description

Osditch and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Colluvium derived from quartzite and argillite

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—white fir, quaking aspen, mountain snowberry, other shrubs, Oregon grape, common juniper, other perennial forbs, muttongrass, skyline bluegrass, sedge, other perennial grasses, Rocky Mountain Douglas fir, other trees

Site index: Douglas fir—40 at an age base of 50 years

Site index: White fir—42 at an age base of 50 years

Typical profile:

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 3 inches; extremely stony loam

Layer 3—3 to 18 inches; extremely cobbly loam

Layer 4—18 to 60 inches; extremely stony sandy loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: F028AY080NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Rubble land

Composition: 0 to 4 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Ecological site: None

Berrycreek and similar soils

Composition: 0 to 3 percent

Slope: 15 to 50 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—Engelmann's spruce, slender wheatgrass, mountain brome, other trees, quaking aspen, white fir, mountain snowberry, other shrubs, willow, Oregon grape, Utah serviceberry, other perennial forbs, Nevada bluegrass, skyline bluegrass

Ecological site: F028AY078NV

Jonlake and similar soils

Composition: 0 to 3 percent

Slope: 8 to 30 percent, all aspects

Landform: Shoulders of mountains

Typical vegetation: Other shrubs, needlegrass, muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, low sagebrush

Ecological site: R028AY061NV—Claypan 14+ P.Z.

Topeki and similar soils

Composition: 0 to 2 percent

Slope: 30 to 50 percent, east to northwest aspects

Landform: Shoulders of mountains; Summits of mountains

Typical vegetation: Bluebunch wheatgrass, curlleaf mountainmahogany, mountain big sagebrush, other perennial forbs, Letterman needlegrass

Ecological site: R028AY058NV—Stony Mahogany Savanna

Rock outcrop

Composition: 0 to 2 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Ecological site: None

Keyole and similar soils

Composition: 0 to 1 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—other perennial grasses, skyline bluegrass, Ross' sedge, mountain brome, needlegrass, slender wheatgrass, muttongrass, limber pine, quaking aspen, other trees, Engelmann's spruce, gooseberry currant, common juniper, other perennial forbs

Ecological site: F028AY083NV

4140—Lodar-Monarch-Highup association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 7,380 to 8,600

Precipitation: 12 to 24 inches

Air temperature: 43 to 52 degrees Fahrenheit

Frost-free period: 70 to 110 days

Composition

Lodar very gravelly loam, 15 to 50 percent slopes—35 percent

Monarch very cobbly sandy loam, 30 to 75 percent slopes—30 percent

Highup extremely gravelly silt loam, 30 to 75 percent slopes—20 percent

Rock outcrop, 30 to 50 percent slopes—8 percent

Radol very gravelly loam, 8 to 35 percent slopes—4 percent

Zarark very gravelly loam, 30 to 50 percent slopes—3 percent

Component Description

Lodar and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, east to northwest aspects

Parent material: Colluvium and residuum derived from limestone

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—Indian ricegrass, muttongrass, bottlebrush squirreltail, Sandberg bluegrass, other perennial forbs, singleleaf pinyon, Utah juniper, other shrubs, Stansbury cliffrose, wild crab apple, curlleaf mountainmahogany, black sagebrush, other perennial grasses, bluebunch wheatgrass

Site index: Utah juniper—45 at an age base of 100 years

Site index: Singleleaf pinyon—45 at an age base of 100 years

Typical profile:

Surface rock fragments: About 45 percent gravel, 1 percent stones, 15 percent cobbles

Layer 1—0 to 3 inches; very gravelly loam

Layer 2—3 to 7 inches; very gravelly sandy loam

Layer 3—7 to 19 inches; extremely gravelly loam

Layer 4—19 to 25 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 0.8 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY074NV

Component Description

Monarch and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Colluvium and residuum derived from limestone, shale, and fanglomerate

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—Utah serviceberry, other perennial forbs, bluebunch wheatgrass, other perennial grasses, muttongrass, basin wildrye, mountain big sagebrush, curlleaf mountainmahogany, antelope bitterbrush, other shrubs, snowberry

Site index: Utah juniper—75 at an age base of 100 years

Site index: Singleleaf pinyon—75 at an age base of 100 years

Typical profile:

Surface rock fragments: About 1 percent stones, 15 percent cobbles, 30 percent gravel

Layer 1—0 to 6 inches; very cobbly sandy loam

Layer 2—6 to 17 inches; very gravelly loam

Layer 3—17 to 27 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 14 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY077NV

Component Description

Highup and similar soils

Landform: Backslopes of upper mountains

Slope: 30 to 75 percent, east to northwest aspects

Parent material: Colluvium and residuum derived from limestone

Typical vegetation: Mountain big sagebrush, Letterman needlegrass, curleaf mountainmahogany, other perennial forbs, bluebunch wheatgrass

Typical profile:

Surface rock fragments: About 5 percent subangular cobbles, 3 percent subangular stones, 40 percent subangular gravel, 30 percent fine subangular gravel

Layer 1—0 to 10 inches; extremely gravelly silt loam

Layer 2—10 to 25 inches; extremely gravelly loam

Layer 3—25 to 35 inches; bedrock

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 20 to 39 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8e

Ecological site: R028AY058NV—Stony Mahogany Savanna

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Rock outcrop

Composition: 0 to 8 percent

Slope: 30 to 50 percent, all aspects

Landform: Backslopes of mountains

Ecological site: None

Radol and similar soils

Composition: 0 to 4 percent

Slope: 8 to 35 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Other shrubs, singleleaf pinyon, Stansbury cliffrose, other perennial forbs, black sagebrush, bluebunch wheatgrass, other perennial grasses, Indian ricegrass

Ecological site: R028AY102NV—Shallow Calcareous Hill 10-14 P.Z.

Zarark and similar soils

Composition: 0 to 3 percent

Slope: 30 to 50 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Needlegrass, muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, curleaf mountainmahogany

Ecological site: R028AY059NV—Mahogany Savanna

4200—Wardbay-Hauchee-Muiral association*Map Unit Setting*

MLRA: 28A

Landscape: Mountains

Elevation: 7,810 to 9,940

Precipitation: 16 to 28 inches

Air temperature: 36 to 45 degrees Fahrenheit

Frost-free period: 30 to 70 days

Composition

Wardbay extremely gravelly loam, 15 to 50 percent slopes—50 percent

Hauchee very stony loam, 15 to 50 percent slopes—20 percent

Muiral gravelly loam, 15 to 75 percent slopes—15 percent

Badhap very gravelly loam, 15 to 50 percent slopes—5 percent

Brokit very stony highly organic loam, 8 to 30 percent slopes—4 percent

Pinwheeler very gravelly loamy coarse sand, 15 to 50 percent slopes—3 percent

Rock outcrop, 50 to 100 percent slopes—2 percent

Timmercrek family very gravelly loam, 30 to 75 percent slopes—1 percent

Component Description

Wardbay and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, all aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Other perennial grasses, muttongrass, mountain snowberry, other shrubs, other perennial forbs, mountain big sagebrush, bluebunch wheatgrass

Typical profile:

Surface rock fragments: About 20 percent subangular gravel

Layer 1—0 to 18 inches; extremely gravelly loam

Layer 2—18 to 42 inches; extremely cobbly silt loam

Layer 3—42 to 52 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 39 to 60 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8e

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Component Description

Hauchee and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, all aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Curlleaf mountainmahogany, Letterman needlegrass, mountain big sagebrush, other perennial forbs, bluebunch wheatgrass

Typical profile:

Surface rock fragments: About 15 percent subangular stones, 15 percent subangular cobbles, 30 percent subangular gravel

Layer 1—0 to 3 inches; very stony loam

Layer 2—3 to 15 inches; very gravelly loam

Layer 3—15 to 25 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY058NV—Stony Mahogany Savanna

Component Description

Muiral and similar soils

Landform: Backslopes of mountains

Slope: 15 to 75 percent, northwest to east aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—Oregon grape, common juniper, sedge, mountain snowberry, white fir, quaking aspen, skyline bluegrass, other trees, other perennial forbs, other perennial grasses, muttongrass, Rocky Mountain Douglas fir, other shrubs

Site index: Douglas fir—40 at an age base of 50 years

Site index: White fir—42 at an age base of 50 years

Typical profile:

Surface rock fragments: About 5 percent subangular gravel

Layer 1—0 to 2 inches; moderately decomposed plant material

Layer 2—2 to 6 inches; gravelly loam

Layer 3—6 to 39 inches; very gravelly silt loam

Layer 4—39 to 49 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 20 to 39 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7e

Ecological site: F028AY080NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Badhap and similar soils

Composition: 0 to 5 percent

Slope: 15 to 50 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Needlegrass, mountain snowberry, other shrubs, mountain big sagebrush, nodding brome, Utah serviceberry, bluebunch wheatgrass, other perennial grasses, slender wheatgrass, other perennial forbs, mountain brome

Ecological site: R028AY068NV—Loamy Slope 16+ P.Z.

Brokit and similar soils

Composition: 0 to 4 percent

Slope: 8 to 30 percent, northwest to east aspects

Landform: Stream terraces

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—other shrubs, willow, Oregon grape, mountain snowberry, white fir, Engelmann's spruce, quaking aspen, other trees, Utah serviceberry, mountain brome, slender wheatgrass, skyline bluegrass, Nevada bluegrass, other perennial forbs

Ecological site: F028AY078NV

Pinwheeler and similar soils

Composition: 0 to 3 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Bluebunch wheatgrass, other perennial grasses, needlegrass, low sagebrush, other perennial forbs, other shrubs, muttongrass

Ecological site: R028AY061NV—Claypan 14+ P.Z.

Rock outcrop

Composition: 0 to 2 percent

Slope: 50 to 100 percent, all aspects

Landform: Backslopes of mountains

Ecological site: None

Timmercreek family and similar soils

Composition: 0 to 1 percent

Classification: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—mountain big sagebrush, nodding brome, mountain brome, slender wheatgrass, other perennial grasses, other perennial forbs, other shrubs, mountain snowberry, quaking aspen

Ecological site: R028AY073NV—Aspen Thicket

5100—Logring-Hyzen-Canyoung association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 6,760 to 8,530

Precipitation: 12 to 24 inches

Air temperature: 37 to 52 degrees Fahrenheit

Frost-free period: 40 to 110 days

Composition

Logring extremely gravelly loam, 30 to 75 percent slopes—45 percent

Hyzen extremely stony loam, 15 to 50 percent slopes—25 percent

Canyoung extremely gravelly loam, 15 to 50 percent slopes—15 percent

Rock outcrop, 30 to 100 percent slopes—9 percent

Millan very gravelly loam, 15 to 50 percent slopes—6 percent

Component Description

Logring and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, all aspects

Parent material: Residuum and colluvium derived from limestone

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—Indian ricegrass, bottlebrush squirreltail, muttongrass, Sandberg bluegrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, black sagebrush, curlleaf mountainmahogany, wild crab apple, Stansbury cliffrose, other shrubs, Utah juniper, singleleaf pinyon

Site index: Utah juniper—45 at an age base of 100 years

Site index: Singleleaf pinyon—45 at an age base of 100 years

Typical profile:

Surface rock fragments: About 60 percent gravel, 10 percent cobbles

Layer 1—0 to 3 inches; extremely gravelly loam

Layer 2—3 to 10 inches; very gravelly loam

Layer 3—10 to 20 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 7 to 14 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.0 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY074NV

Component Description

Hyzen and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, east to northwest aspects

Parent material: Colluvium and residuum derived from limestone and dolomite

Typical vegetation: Stansbury cliffrose, spiny greasebush, littleleaf mountain mahogany, black sagebrush, other perennial forbs, Scribner needlegrass, other shrubs

Typical profile:

Surface rock fragments: About 20 percent angular stones, 10 percent angular cobbles, 45 percent angular gravel

Layer 1—0 to 2 inches; extremely stony loam

Layer 2—2 to 12 inches; extremely stony loam

Layer 3—12 to 16 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 6 to 14 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 0.8 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY029NV—Limestone Hill

Component Description

Canyoung and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, northwest to east aspects

Parent material: Colluvium derived from limestone, dolomite and calcareous shale

Typical vegetation: Muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, curleaf mountainmahogany, needlegrass

Typical profile:

Surface rock fragments: About 1 percent subangular stones, 30 percent fine subangular gravel, 30 percent subangular gravel, 5 percent subangular cobbles

Layer 1—0 to 12 inches; extremely gravelly loam

Layer 2—12 to 60 inches; extremely gravelly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY059NV—Mahogany Savanna

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Rock outcrop

Composition: 0 to 9 percent

Slope: 30 to 100 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Ecological site: None

Millan and similar soils

Composition: 0 to 6 percent

Slope: 15 to 50 percent, northwest to east aspects

Landform: Backslopes of fan remnants

Typical vegetation: Bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, other shrubs, Indian ricegrass, muttongrass, other perennial grasses

Ecological site: R028AY064NV—Shallow Loam 10-14 P.Z.

5102—Canyoung-Zarark-Wardbay association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 7,450 to 8,430

Precipitation: 18 to 28 inches

Air temperature: 36 to 43 degrees Fahrenheit

Frost-free period: 40 to 60 days

Composition

Canyoung extremely gravelly loam, 4 to 15 percent slopes—40 percent

Zarark very gravelly loam, 4 to 15 percent slopes—30 percent

Wardbay extremely gravelly loam, 15 to 30 percent slopes—20 percent

Rock outcrop, 30 to 50 percent slopes—4 percent

Hyzen extremely stony loam, 15 to 50 percent slopes—3 percent

Millan very gravelly loam, 15 to 50 percent slopes—2 percent

Amtoft very gravelly loam, 15 to 50 percent slopes—1 percent

Component Description

Canyoung and similar soils

Landform: Backslopes of mountains

Slope: 4 to 15 percent, northwest to east aspects

Parent material: Colluvium derived from limestone, dolomite and calcareous shale

Typical vegetation: Mountain big sagebrush, curlleaf mountainmahogany, needlegrass, muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs

Typical profile:

Surface rock fragments: About 1 percent subangular stones, 5 percent subangular cobbles, 30 percent fine subangular gravel, 30 percent subangular gravel

Layer 1—0 to 12 inches; extremely gravelly loam

Layer 2—12 to 60 inches; extremely gravelly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY059NV—Mahogany Savanna

Component Description

Zarark and similar soils

Landform: Backslopes of mountains

Slope: 4 to 15 percent, east to northwest aspects

Parent material: Residuum and colluvium derived from limestone

Typical vegetation: Mountain big sagebrush, other perennial forbs, curleaf mountainmahogany, bluebunch wheatgrass, other perennial grasses, muttongrass, needlegrass

Typical profile:

Surface rock fragments: 20 percent subangular cobbles, 15 percent subangular gravel, 5 percent fine subangular gravel

Layer 1—0 to 4 inches; very gravelly loam

Layer 2—4 to 18 inches; very gravelly fine sandy loam

Layer 3—18 to 28 inches; very gravelly sandy loam

Layer 4—28 to 37 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Depth to restrictive feature: Lithic bedrock: 20 to 39 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 2 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY059NV—Mahogany Savanna

Component Description

Wardbay and similar soils

Landform: Backslopes of mountains

Slope: 15 to 30 percent, northwest to east aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Bluebunch wheatgrass, mountain big sagebrush, other perennial forbs, other perennial grasses, other shrubs, muttongrass, mountain snowberry

Typical profile:

Surface rock fragments: About 20 percent subangular gravel

Layer 1—0 to 18 inches; extremely gravelly loam

Layer 2—18 to 42 inches; extremely cobbly silt loam

Layer 3—42 to 52 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 39 to 60 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8e

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Rock outcrop

Composition: 0 to 4 percent

Slope: 30 to 50 percent, all aspects

Landform: Backslopes of mountains

Ecological site: None

Hyzen and similar soils

Composition: 0 to 3 percent

Slope: 15 to 50 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Other shrubs, Stansbury cliffrose, spiny greasewood, littleleaf mountain mahogany, black sagebrush, Scribner needlegrass, other perennial forbs

Ecological site: R028AY029NV—Limestone Hill

Millan and similar soils

Composition: 0 to 2 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of fan remnants

Typical vegetation: Muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, other shrubs, Indian ricegrass, mountain big sagebrush

Ecological site: R028AY064NV—Shallow Loam 10-14 P.Z.

Amtoft and similar soils

Composition: 0 to 1 percent

Slope: 15 to 50 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Other shrubs, Indian ricegrass, needleandthread, bluebunch wheatgrass, other perennial forbs, Stansbury cliffrose, black sagebrush

Ecological site: R028AY034NV—Shallow Calcareous Slope 10-14 P.Z.

5110—Garnel-Garnel, very steep-Rock outcrop association*Map Unit Setting*

MLRA: 28A

Landscape: Mountains

Elevation: 6,790 to 8,660

Precipitation: 16 to 20 inches

Air temperature: 39 to 43 degrees Fahrenheit

Frost-free period: 40 to 70 days

Composition

Garnel very gravelly coarse sandy loam, 8 to 30 percent slopes—45 percent

Garnel very gravelly coarse sandy loam, 30 to 75 percent slopes—30 percent

Rock outcrop, 30 to 75 percent slopes—15 percent

Jonlake extremely gravelly loam, 8 to 30 percent slopes—5 percent

Kious extremely gravelly loamy coarse sand, 15 to 50 percent slopes—5 percent

Component Description

Garnet and similar soils

Landform: Backslopes of mountains

Slope: 8 to 30 percent, all aspects



Figure 11— Over-mature pinyon and juniper on this stable surface of the Garnet soil.

Parent material: Colluvium and residuum derived from granite

Typical vegetation: Forest canopy—singleleaf pinyon (Fig. 11)

Forest understory—bluebunch wheatgrass, singleleaf pinyon, mountain big sagebrush, Utah serviceberry, other perennial forbs, other shrubs, other perennial grasses, muttongrass

Site index: Singleleaf pinyon—20 at an age base of 100 years

Typical profile:

Surface rock fragments: About 1 percent angular stones, 50 percent angular gravel, 2 percent angular cobbles

Layer 1—0 to 7 inches; very gravelly coarse sandy loam

Layer 2—7 to 12 inches; very gravelly sandy clay loam

Layer 3—12 to 20 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Paralithic bedrock: 10 to 14 inches; Lithic bedrock: 20 to 39 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 0.9 inch
 Present flooding: None
 Present ponding: None
 Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s
 Ecological site: F028AY076NV

Component Description

Garnel very steep and similar soils
 Landform: Backslopes of mountains
 Slope: 30 to 75 percent, northwest to east aspects
 Parent material: Colluvium and residuum derived from granite
 Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon
 Forest understory—other perennial grasses, muttongrass, basin wildrye, other perennial
 forbs, Utah serviceberry, mountain big sagebrush, curleaf mountainmahogany, antelope bitterbrush,
 other shrubs, snowberry, bluebunch wheatgrass
 Site index: Utah juniper—75 at an age base of 100 years
 Site index: Singleleaf pinyon—75 at an age base of 100 years

Typical profile:

Surface rock fragments: About 1 percent angular stones, 2 percent angular cobbles, 50 percent angular
 gravel
 Layer 1—0 to 7 inches; very gravelly coarse sandy loam
 Layer 2—7 to 12 inches; very gravelly sandy clay loam
 Layer 3—12 to 20 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high
 Depth to restrictive feature: Paralithic bedrock: 10 to 14 inches; Lithic bedrock: 20 to 39 inches
 Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)
 Available water capacity: About 0.9 inch
 Present flooding: None
 Present ponding: None
 Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s
 Ecological site: F028AY077NV

Component Description

Rock outcrop
 Landform: Backslopes of mountains
 Slope: 30 to 75 percent, all aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Jonlake and similar soils
 Composition: 0 to 5 percent
 Slope: 8 to 30 percent, all aspects
 Landform: Summits of mountains; Shoulders of mountains

Typical vegetation: Bluebunch wheatgrass, needlegrass, muttongrass, other perennial grasses, other perennial forbs, low sagebrush, other shrubs
 Ecological site: R028AY061NV—Claypan 14+ P.Z.

Kious and similar soils

Composition: 0 to 5 percent

Slope: 15 to 50 percent, east to northwest aspects

Landform: Backslopes of upper mountains

Typical vegetation: Needlegrass, other perennial grasses, curleaf mountainmahogany, muttongrass, mountain big sagebrush, bluebunch wheatgrass, other perennial forbs

Ecological site: R028AY059NV—Mahogany Savanna

5140—Wardbay-Canyoung-Rock outcrop association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 6,820 to 9,190

Precipitation: 18 to 28 inches

Air temperature: 36 to 43 degrees Fahrenheit

Frost-free period: 40 to 60 days

Composition

Wardbay extremely gravelly loam, 8 to 30 percent slopes—45 percent

Canyoung extremely gravelly loam, 30 to 75 percent slopes—25 percent

Rock outcrop, 30 to 75 percent slopes—15 percent

Wardbay extremely gravelly loam, 30 to 75 percent slopes—5 percent

Amtoft very gravelly loam, 30 to 75 percent slopes—5 percent

Hardol very gravelly silt loam, 30 to 75 percent slopes—5 percent

Component Description

Wardbay and similar soils

Landform: Backslopes of mountains

Slope: 8 to 30 percent, all aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Other perennial grasses, muttongrass, other perennial forbs, mountain big sagebrush, bluebunch wheatgrass, other shrubs, mountain snowberry

Typical profile:

Surface rock fragments: About 20 percent subangular gravel

Layer 1—0 to 18 inches; extremely gravelly loam

Layer 2—18 to 42 inches; extremely cobbly silt loam

Layer 3—42 to 52 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 39 to 60 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8e

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Component Description

Canyoung and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, all aspects

Parent material: Colluvium derived from limestone, dolomite and calcareous shale

Typical vegetation: Curlleaf mountainmahogany, mountain big sagebrush, other perennial forbs, bluebunch wheatgrass, other perennial grasses, muttongrass, needlegrass

Typical profile:

Surface rock fragments: About 1 percent subangular stones, 5 percent subangular cobbles, 30 percent subangular gravel, 30 percent fine subangular gravel

Layer 1—0 to 12 inches; extremely gravelly loam

Layer 2—12 to 60 inches; extremely gravelly loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY059NV—Mahogany Savanna

Component Description

Rock outcrop

Landform: Backslopes of mountains

Slope: 30 to 75 percent, all aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Wardbay and similar soils

Composition: 0 to 5 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, other shrubs, mountain snowberry, basin wildrye, muttongrass, other perennial grasses

Ecological site: R028AY067NV—Calcareous Loam 14+ P.Z.

Amtoft and similar soils

Composition: 0 to 5 percent

Slope: 30 to 75 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Other shrubs, Stansbury cliffrose, black sagebrush, other perennial forbs, Indian ricegrass, bluebunch wheatgrass, needleandthread

Ecological site: R028AY034NV—Shallow Calcareous Slope 10-14 P.Z.

Hardol and similar soils

Composition: 0 to 5 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Needlegrass, other perennial grasses, curlleaf mountainmahogany, other trees, mountain snowberry, other perennial forbs, other shrubs

Ecological site: R028AY060NV—Mahogany Thicket

5160—Hyzen-Rock outcrop association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 7,420 to 10,600

Precipitation: 12 to 16 inches

Air temperature: 39 to 45 degrees Fahrenheit

Frost-free period: 70 to 100 days

Composition

Hyzen extremely stony loam, 30 to 75 percent slopes—65 percent

Rock outcrop, 50 to 100 percent slopes—20 percent

Lodar very gravelly loam, 50 to 75 percent slopes—6 percent

Canyoung extremely gravelly loam, 30 to 75 percent slopes—5 percent

Hardol very gravelly silt loam, 50 to 75 percent slopes—4 percent

Component Description

Hyzen and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, east to northwest aspects

Parent material: Colluvium and residuum derived from limestone and dolomite

Typical vegetation: Other shrubs, other perennial forbs, Scribner needlegrass, black sagebrush, littleleaf mountain mahogany, spiny greasewood, Stansbury cliffrose

Typical profile:

Surface rock fragments: About 45 percent angular gravel, 10 percent angular cobbles, 20 percent angular stones

Layer 1—0 to 2 inches; extremely stony loam

Layer 2—2 to 12 inches; extremely stony loam

Layer 3—12 to 16 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 6 to 14 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 0.8 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY029NV—Limestone Hill

Component Description

Rock outcrop

Landform: Backslopes of mountains; Summits of mountains

Slope: 50 to 100 percent, east to northwest aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Lodar and similar soils

Composition: 0 to 6 percent

Slope: 50 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—Utah juniper, Indian ricegrass, black sagebrush, bottlebrush squirreltail, muttongrass, Sandberg bluegrass, other perennial grasses, bluebunch wheatgrass, curlleaf mountainmahogany, wild crab apple, Stansbury cliffrose, other shrubs, singleleaf pinyon, other perennial forbs

Ecological site: F028AY074NV

Canyoung and similar soils

Composition: 0 to 5 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Muttongrass, curlleaf mountainmahogany, mountain big sagebrush, other perennial forbs, bluebunch wheatgrass, needlegrass, other perennial grasses

Ecological site: R028AY059NV—Mahogany Savanna

Hardol and similar soils

Composition: 0 to 4 percent

Slope: 50 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Needlegrass, other perennial grasses, other perennial forbs, curlleaf mountainmahogany, mountain snowberry, other trees, other shrubs

Ecological site: R028AY060NV—Mahogany Thicket

5210—Badhap-Topeki association*Map Unit Setting*

MLRA: 28A

Landscape: Mountains

Elevation: 7,740 to 10,500

Precipitation: 16 to 28 inches

Air temperature: 37 to 43 degrees Fahrenheit

Frost-free period: 30 to 60 days

Composition

Badhap very stony loam, 30 to 75 percent slopes—35 percent

Badhap very gravelly loam, 15 to 50 percent slopes—25 percent

Topeki extremely gravelly loam, 8 to 30 percent slopes—25 percent

Jonlake extremely gravelly loam, 8 to 30 percent slopes—8 percent

Berrycreek very gravelly loam, 8 to 30 percent slopes—3 percent

Osditch extremely stony loam, 15 to 50 percent slopes—2 percent

Rock outcrop, 50 to 100 percent slopes—2 percent

Component Description

Badhap and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, all aspects

Parent material: Colluvium and residuum derived from quartzite

Typical vegetation: Mountain big sagebrush, other perennial forbs, other perennial grasses, bluebunch wheatgrass, muttongrass, other shrubs, mountain snowberry

Typical profile:

Layer 1—0 to 3 inches; very stony loam

Layer 2—3 to 44 inches; extremely cobbly loam

Layer 3—44 to 60 inches; extremely cobbly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Component Description

Badhap and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, northwest to east aspects

Parent material: Colluvium and residuum derived from quartzite

Typical vegetation: Mountain snowberry, other shrubs, mountain big sagebrush, other perennial forbs, other perennial grasses, mountain brome, slender wheatgrass, needlegrass, nodding brome

Typical profile:

Layer 1—0 to 3 inches; very gravelly loam

Layer 2—3 to 44 inches; extremely cobbly loam

Layer 3—44 to 60 inches; extremely cobbly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY057NV—Loamy 16+ P.Z.

Component Description

Topeki and similar soils

Landform: Shoulders of mountains; Summits of mountains (Fig. 12)

Slope: 8 to 30 percent, east to northwest aspects

Parent material: Colluvium and residuum derived from quartzite

Typical vegetation: Curleaf mountainmahogany, mountain big sagebrush, bluebunch wheatgrass, Letterman needlegrass, other perennial forbs

Typical profile:

Surface rock fragments: About 3 percent subangular boulders, 20 percent subangular stones, 20 percent subangular cobbles, 20 percent subangular gravel

Layer 1—0 to 12 inches; extremely gravelly loam

Layer 2—12 to 15 inches; extremely stony loam

Layer 3—15 to 25 inches; bedrock

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.2 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY058NV—Stony Mahogany Savanna

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Jonlake and similar soils

Composition: 0 to 8 percent

Slope: 8 to 30 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Typical vegetation: Needlegrass, other perennial grasses, muttongrass, other shrubs, low sagebrush, other perennial forbs, bluebunch wheatgrass

Ecological site: R028AY061NV—Claypan 14+ P.Z.

Berrycreek and similar soils

Composition: 0 to 3 percent

Slope: 8 to 30 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—slender wheatgrass, mountain brome, Nevada bluegrass, mountain snowberry, Utah serviceberry, other trees, quaking aspen, Engelmann's spruce, white fir, skyline bluegrass, other shrubs, other perennial forbs, willow, Oregon grape

Ecological site: F028AY078NV

Osditch and similar soils

Composition: 0 to 2 percent

Slope: 15 to 50 percent, northwest to east aspects

Landform: Backslopes of mountains



Figure 12— The Topeki soil is on shoulders and summits of mountains. The characteristic curlleaf mountainmahogany vegetation is common on the soil.

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—sedge, other perennial grasses, skyline bluegrass, common juniper, Oregon grape, other shrubs, mountain snowberry, white fir, quaking aspen, other perennial forbs, muttongrass, Rocky Mountain Douglas fir, other trees

Ecological site: F028AY080NV

Rock outcrop

Composition: 0 to 2 percent

Slope: 50 to 100 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Ecological site: None

5220—Basinpeak-Badhap association*Map Unit Setting*

MLRA: 28A

Landscape: Mountains

Elevation: 7,550 to 9,780

Precipitation: 16 to 28 inches

Air temperature: 37 to 43 degrees Fahrenheit

Frost-free period: 30 to 60 days

Composition

Basinpeak very gravelly loam, 8 to 50 percent slopes—60 percent

Badhap very gravelly loam, 15 to 50 percent slopes—25 percent

Badhap very stony loam, 15 to 50 percent slopes—8 percent

Topeki extremely gravelly loam, 8 to 30 percent slopes—5 percent

Berrycreek very gravelly loam, 15 to 50 percent slopes—2 percent

Component Description

Basinpeak and similar soils

Landform: Backslopes of mountains

Slope: 8 to 50 percent, all aspects

Parent material: Colluvium and residuum derived from quartzite and granite

Typical vegetation: Needlegrass, bluebunch wheatgrass, other perennial grasses, other shrubs, low sagebrush, muttongrass, other perennial forbs (Fig. 13)

Typical profile:

Surface rock fragments: About 5 percent cobbles, 10 percent stones, 30 percent gravel

Layer 1—0 to 11 inches; very gravelly loam

Layer 2—11 to 60 inches; extremely gravelly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY061NV—Claypan 14+ P.Z.

Component Description

Badhap and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, all aspects

Parent material: Colluvium and residuum derived from quartzite

Typical vegetation: Mountain snowberry, other shrubs, Utah serviceberry, other perennial forbs, bluebunch wheatgrass, other perennial grasses, mountain big sagebrush, slender wheatgrass, needlegrass, nodding brome, mountain brome

Typical profile:

Layer 1—0 to 3 inches; very gravelly loam

Layer 2—3 to 44 inches; extremely cobbly loam

Layer 3—44 to 60 inches; extremely cobbly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.



Figure 13 —The Basinpeak soil (foreground) is a very deep soil with low sagebrush and bluebunch wheatgrass vegetation.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY068NV—Loamy Slope 16+ P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Badhap and similar soils

Composition: 0 to 8 percent

Layer 3—42 to 52 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 39 to 60 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8e

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Component Description

Haunchee and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, east to northwest aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Needlegrass, muttongrass, other perennial forbs, bluebunch wheatgrass, curleaf mountainmahogany, mountain big sagebrush, other perennial grasses

Typical profile:

Surface rock fragments: About 30 percent subangular gravel, 15 percent subangular cobbles, 15 percent subangular stones

Layer 1—0 to 3 inches; very stony loam

Layer 2—3 to 15 inches; very gravelly loam

Layer 3—15 to 25 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY059NV—Mahogany Savanna

Component Description

Bakerpeak and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Colluvium derived from limestone and shale

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—Rocky Mountain Douglas fir, quaking aspen, other trees, white fir, mountain snowberry, other shrubs, Oregongrape, other perennial forbs, common juniper, sedge, other perennial grasses, muttongrass, skyline bluegrass

Site index: Douglas fir—40 at an age base of 50 years

Site index: White fir—42 at an age base of 50 years

Typical profile:

Surface rock fragments: About 1 percent subangular stones, 2 percent subangular cobbles, 70 percent subangular gravel

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 5 inches; very gravelly loam

Layer 3—5 to 13 inches; extremely gravelly loam

Layer 4—13 to 61 inches; extremely gravelly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY080NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Bricone and similar soils

Composition: 0 to 5 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Great Basin bristlecone pine, limber pine

Forest understory—common juniper, currant, other shrubs, limber pine, Great Basin bristlecone pine, whitestem goldenbush, Wheeler's bluegrass, skyline bluegrass, other perennial forbs, sedge, other perennial grasses

Ecological site: F028AY081NV

Badhap and similar soils

Composition: 0 to 4 percent

Slope: 15 to 50 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Mountain brome, other perennial grasses, bluebunch wheatgrass, slender wheatgrass, needlegrass, Utah serviceberry, other perennial forbs, nodding brome, mountain big sagebrush, other shrubs, mountain snowberry

Ecological site: R028AY068NV—Loamy Slope 16+ P.Z.

Rock outcrop

Composition: 0 to 4 percent

Slope: 15 to 50 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Ecological site: None

Brokit and similar soils

Composition: 0 to 2 percent

Slope: 8 to 30 percent, northwest to east aspects

Landform: Toeslopes of stream terraces

Typical vegetation: Forest canopy—quaking aspen

Forest understory—other perennial grasses, other perennial forbs, willow, Nevada bluegrass, mountain snowberry, rush, other shrubs, skyline bluegrass, sedge, slender wheatgrass, white fir, quaking aspen, other trees

Ecological site: F028AY056NV

5241—Haunchee-Canyoung-Rock outcrop association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 7,710 to 9,880

Precipitation: 16 to 28 inches

Air temperature: 36 to 45 degrees Fahrenheit

Frost-free period: 30 to 70 days

Composition

Haunchee very stony loam, 30 to 75 percent slopes—40 percent

Canyoung extremely gravelly loam, 15 to 50 percent slopes—30 percent

Rock outcrop, 50 to 100 percent slopes—20 percent

Wardbay extremely gravelly loam, 15 to 50 percent slopes—4 percent

Brokit very stony highly organic loam, 8 to 30 percent slopes—3 percent

Bakerpeak very gravelly loam, 30 to 75 percent slopes—3 percent

Component Description

Haunchee and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, east to northwest aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Letterman needlegrass, curleaf mountainmahogany, bluebunch wheatgrass, other perennial forbs, mountain big sagebrush

Typical profile:

Surface rock fragments: About 30 percent subangular gravel, 15 percent subangular cobbles, 15 percent subangular stones

Layer 1—0 to 3 inches; very stony loam

Layer 2—3 to 15 inches; very gravelly loam

Layer 3—15 to 25 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY058NV—Stony Mahogany Savanna

Component Description

Canyoung and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, all aspects

Parent material: Colluvium derived from limestone, dolomite and calcareous shale

Typical vegetation: Other perennial forbs, curleaf mountainmahogany, needlegrass, muttongrass, other perennial grasses, bluebunch wheatgrass, mountain big sagebrush

Typical profile:

Surface rock fragments: About 5 percent subangular cobbles, 1 percent subangular stones, 30 percent subangular gravel, 30 percent fine subangular gravel

Layer 1—0 to 12 inches; extremely gravelly loam

Layer 2—12 to 60 inches; extremely gravelly loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY059NV—Mahogany Savanna

Component Description

Rock outcrop

Landform: Summits of mountains; Shoulders of mountains

Slope: 50 to 100 percent, all aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Wardbay and similar soils

Composition: 0 to 4 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Mountain snowberry, other shrubs, bluebunch wheatgrass, mountain big sagebrush, other perennial forbs, other perennial grasses, muttongrass

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Brokit and similar soils

Composition: 0 to 3 percent

Slope: 8 to 30 percent, all aspects

Landform: Stream terraces

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—skyline bluegrass, Engelmann's spruce, white fir, mountain snowberry, slender wheatgrass, mountain brome, other trees, quaking aspen, other shrubs, willow, Oregongrape, Utah serviceberry, other perennial forbs, Nevada bluegrass

Ecological site: F028AY078NV

Bakerpeak and similar soils

Composition: 0 to 3 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—sedge, skyline bluegrass, other trees, Rocky Mountain Douglas fir, quaking aspen, white fir, mountain snowberry, other shrubs, Oregon grape, common juniper, other perennial forbs, other perennial grasses, muttongrass

Ecological site: F028AY080NV

5250—Bricone-Piar-Linpeak association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 7,680 to 11,300

Precipitation: 24 to 37 inches

Air temperature: 35 to 39 degrees Fahrenheit

Frost-free period: 30 to 50 days

Composition

Bricone very gravelly fine sandy loam, 30 to 75 percent slopes—55 percent

Piar very gravelly loam, 30 to 75 percent slopes—15 percent

Linpeak gravelly loam, 15 to 50 percent slopes—15 percent

Bakerpeak very gravelly loam, 30 to 75 percent slopes—5 percent

Rock outcrop, 30 to 75 percent slopes—4 percent

Windwash extremely gravelly loamy coarse sand, 15 to 50 percent slopes—4 percent

Timmercreek family very gravelly loam, 30 to 75 percent slopes—2 percent

Component Description

Bricone and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, east to northwest aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Forest canopy—Great Basin bristlecone pine, limber pine

Forest understory—Great Basin bristlecone pine, other shrubs, currant, common juniper, sedge, other perennial forbs, limber pine, Wheeler's bluegrass, other perennial grasses, skyline bluegrass, whitestem goldenbush

Typical profile:

Surface rock fragments: About 5 percent subangular stones, 60 percent subangular gravel, 10 percent subangular cobbles

Layer 1—0 to 3 inches; very gravelly fine sandy loam

Layer 2—3 to 13 inches; extremely gravelly fine sandy loam

Layer 3—13 to 23 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.0 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY081NV

Component Description

Piar and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, east to northwest aspects

Parent material: Colluvium and residuum from limestone and calcareous shale

Typical vegetation: Forest canopy—Great Basin bristlecone pine, limber pine

Forest understory—Ross' sedge, other trees, Great Basin bristlecone pine, limber pine, gooseberry currant, Oregon grape, common juniper, whitestem goldenbush, other perennial forbs, other perennial grasses, Wheeler's bluegrass, skyline bluegrass

Typical profile:

Surface rock fragments: About 5 percent subangular cobbles, 1 percent subangular stones, 40 percent subangular gravel

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 3 inches; very gravelly loam

Layer 3—3 to 13 inches; extremely gravelly loam

Layer 4—13 to 53 inches; extremely gravelly loam

Layer 5—53 to 63 inches; bedrock

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 39 to 59 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY082NV

Component Description

Linpeak and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, northwest to east aspects

Parent material: Colluvium derived from limestone and calcareous shale

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—mountain brome, Ross' sedge, skyline bluegrass, other perennial grasses, other perennial forbs, gooseberry currant, American red raspberry, mountain snowberry, white fir, Engelmann's spruce, limber pine, quaking aspen, needlegrass

Site index: Engelmann's spruce—53 at an age base of 100 years

Typical profile:

Surface rock fragments: About 30 percent subrounded gravel

Layer 1—0 to 2 inches; slightly decomposed plant material

Layer 2—2 to 3 inches; gravelly loam

Layer 3—3 to 14 inches; very gravelly loam

Layer 4—14 to 32 inches; very gravelly loam

Layer 5—32 to 62 inches; extremely gravelly loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Moderately well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY084NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Bakerpeak and similar soils

Composition: 0 to 5 percent

Slope: 30 to 75 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—other shrubs, Oregon grape, mountain snowberry, muttongrass, other perennial grasses, common juniper, other perennial forbs, white fir, quaking aspen, skyline bluegrass, Rocky Mountain Douglas fir, other trees, sedge

Ecological site: F028AY080NV

Rock outcrop

Composition: 0 to 4 percent

Slope: 30 to 75 percent, all aspects

Landform: Summits of mountains; Shoulders of mountains

Ecological site: None

Windwash and similar soils

Composition: 0 to 4 percent

Slope: 15 to 50 percent, all aspects

Landform: Summits of mountains; Shoulders of mountains

Typical vegetation: Engelmann's spruce, dunhead sedge, Ross' sedge, alpine fescue, timberline bluegrass, Wheeler bluegrass, other perennial forbs

Ecological site: R028AY070NV—Calcareous Alpine Ridge

Timmercreek family and similar soils

Composition: 0 to 2 percent

Classification: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—slender wheatgrass, nodding brome, mountain brome, other perennial grasses, other perennial forbs, mountain big sagebrush, other shrubs, mountain snowberry, quaking aspen

Ecological site: R028AY073NV—Aspen Thicket

5251—Bricone-Piar-Rock outcrop association*Map Unit Setting*

MLRA: 28A

Landscape: Mountains

Elevation: 8,070 to 11,100

Precipitation: 24 to 37 inches

Air temperature: 35 to 39 degrees Fahrenheit

Frost-free period: 30 to 50 days

Composition

Bricone very gravelly fine sandy loam, 15 to 75 percent slopes—50 percent

Piar very gravelly loam, 30 to 75 percent slopes—20 percent

Rock outcrop, 30 to 100 percent slopes—15 percent

Rubble land, 30 to 75 percent slopes—4 percent

Timmercreek family very gravelly loam, 15 to 50 percent slopes—3 percent

Piar very gravelly loam, 30 to 75 percent slopes—3 percent

Linpeak gravelly loam, 30 to 75 percent slopes—3 percent

Bakerpeak very gravelly loam, 30 to 75 percent slopes—2 percent

Component Description

Bricone and similar soils

Landform: Backslopes of mountains (Fig. 14)

Slope: 15 to 75 percent, east to northwest aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Forest canopy—Great Basin bristlecone pine, limber pine

Forest understory—common juniper, currant, other shrubs, limber pine, Great Basin bristlecone pine, Wheeler's bluegrass, whitestem goldenbush, sedge, other perennial forbs, skyline bluegrass, other perennial grasses

Typical profile:

Surface rock fragments: About 60 percent subangular gravel, 5 percent subangular stones, 10 percent subangular cobbles

Layer 1—0 to 3 inches; very gravelly fine sandy loam

Layer 2—3 to 13 inches; extremely gravelly fine sandy loam

Layer 3—13 to 23 inches; bedrock

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.0 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY081NV



Figure 14—The high elevation mountain backslopes as seen in the center of the photo have Bricone soils with bristlecone pine and limber pine.

Component Description

Piar and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Colluvium and residuum from limestone and calcareous shale

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—other trees, quaking aspen, limber pine, Engelmann's spruce, gooseberry currant, common juniper, other perennial forbs, other perennial grasses, muttongrass, skyline bluegrass, slender wheatgrass, Ross' sedge, mountain brome, needlegrass

Site index: Engelmann's spruce—30 at an age base of 100 years

Typical profile:

Surface rock fragments: About 1 percent subangular stones, 5 percent subangular cobbles, 40 percent subangular gravel

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 3 inches; very gravelly loam

Layer 3—3 to 13 inches; extremely gravelly loam

Layer 4—13 to 53 inches; extremely gravelly loam

Layer 5—53 to 63 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 39 to 59 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY083NV

Component Description

Rock outcrop

Landform: Backslopes of mountains

Slope: 30 to 100 percent, all aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Rubble land

Composition: 0 to 4 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Ecological site: None

Timmercrek family and similar soils

Composition: 0 to 3 percent

Classification: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—mountain snowberry, slender wheatgrass, mountain brome, quaking aspen, nodding brome, other perennial grasses, other shrubs, other perennial forbs, mountain big sagebrush

Ecological site: R028AY073NV—Aspen Thicket

Piar and similar soils

Composition: 0 to 3 percent

Slope: 30 to 75 percent, east to northwest aspects

Landform: Backslopes of higher elevation mountains

Typical vegetation: Forest canopy—Great Basin bristlecone pine, limber pine

Forest understory—Ross' sedge, skyline bluegrass, Wheeler's bluegrass, other perennial grasses, other perennial forbs, whitestem goldenbush, Oregon grape, gooseberry currant, limber pine, common juniper, other trees, Great Basin bristlecone pine

Ecological site: F028AY082NV

Linpeak and similar soils

Composition: 0 to 3 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—Engelmann's spruce, Ross' sedge, mountain brome, limber pine, quaking aspen, white fir, needlegrass, skyline bluegrass, other perennial grasses, other perennial forbs, gooseberry currant, American red raspberry, mountain snowberry

Ecological site: F028AY084NV

Bakerpeak and similar soils

Composition: 0 to 2 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—sedge, mountain snowberry, common juniper, Rocky Mountain Douglas fir, Oregon grape, other shrubs, white fir, quaking aspen, skyline bluegrass, muttongrass, other perennial grasses, other perennial forbs, other trees

Ecological site: F028AY080NV

5252—Bricone-Rock outcrop association, steep

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 8,040 to 10,900

Precipitation: 24 to 37 inches

Air temperature: 35 to 39 degrees Fahrenheit

Frost-free period: 30 to 50 days

Composition

Bricone very gravelly fine sandy loam, 30 to 75 percent slopes—60 percent

Rock outcrop, 50 to 100 percent slopes—30 percent

Hyzen extremely stony loam, 50 to 75 percent slopes—5 percent

Monarch very cobbly sandy loam, 30 to 75 percent slopes—5 percent

Component Description

Bricone and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Forest canopy—Great Basin bristlecone pine, limber pine

Forest understory—common juniper, other perennial forbs, other perennial grasses, currant, other shrubs, whitestem goldenbush, limber pine, Great Basin bristlecone pine, Wheeler's bluegrass, skyline bluegrass, sedge

Typical profile:

Surface rock fragments: About 60 percent subangular gravel, 10 percent subangular cobbles, 5 percent subangular stones

Layer 1—0 to 3 inches; very gravelly fine sandy loam

Layer 2—3 to 13 inches; extremely gravelly fine sandy loam

Layer 3—13 to 23 inches; bedrock

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderate)

Available water capacity: About 1.0 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY081NV

Component Description

Rock outcrop

Landform: Summits of mountains; Shoulders of mountains

Slope: 50 to 100 percent, all aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Hyzen and similar soils

Composition: 0 to 5 percent

Slope: 50 to 75 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Scribner needlegrass, other perennial forbs, black sagebrush, littleleaf mountain mahogany, spiny greasebush, other shrubs, Stansbury cliffrose

Ecological site: R028AY029NV—Limestone Hill

Monarch and similar soils

Composition: 0 to 5 percent

Slope: 30 to 75 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—other perennial grasses, muttongrass, basin wildrye, snowberry, mountain big sagebrush, bluebunch wheatgrass, antelope bitterbrush, Utah serviceberry, curlleaf mountainmahogany, other perennial forbs, other shrubs

Ecological site: F028AY077NV

5253—Windwash-Bricone-Rock outcrop association*Map Unit Setting*

MLRA: 28A

Landscape: Mountains

Elevation: 9,090 to 11,700

Precipitation: 20 to 37 inches

Air temperature: 32 to 39 degrees Fahrenheit

Frost-free period: 20 to 50 days

Composition

Windwash extremely gravelly loamy coarse sand, 8 to 50 percent slopes—40 percent

Bricone very gravelly fine sandy loam, 30 to 75 percent slopes—30 percent

Rock outcrop, 50 to 100 percent slopes—15 percent

Rubble land, 30 to 75 percent slopes—6 percent

Piar very gravelly loam, 30 to 75 percent slopes—4 percent

Timmercreek family very gravelly loam, 30 to 75 percent slopes—3 percent

Windwash extremely gravelly loamy coarse sand, 15 to 50 percent slopes—2 percent

Component Description

Windwash and similar soils

Landform: Shoulders of mountains; Summits of mountains

Slope: 8 to 50 percent, all aspects

Parent material: Colluvium and residuum derived from limestone and dolomite

Typical vegetation: Dunhead sedge, Ross' sedge, alpine fescue, timberline bluegrass, Wheeler bluegrass, other perennial forbs, Engelmann's spruce (Fig.15)

Typical profile:

Surface rock fragments: About 2 percent angular boulders, 8 percent angular stones, 20 percent angular cobbles, 50 percent angular gravel

Layer 1—0 to 6 inches; extremely gravelly loamy coarse sand

Layer 2—6 to 13 inches; extremely gravelly sandy loam

Layer 3—13 to 22 inches; extremely gravelly loam

Layer 4—22 to 32 inches; bedrock



Figure 15—The Windwash series is on high mountain ridges and summits. The vegetation is a sparse stand of low-statured forbs, grasses, and a scattering of stunted Engelmann's spruce.

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 20 to 39 inches

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately Rapid)

Available water capacity: About 1.2 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY070NV—Calcareous Alpine Ridge

Component Description

Bricone and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, east to northwest aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Forest canopy—Great Basin bristlecone pine, limber pine

Forest understory—Great Basin bristlecone pine, other shrubs, currant, common juniper, whitestem goldenbush, other perennial forbs, other perennial grasses, Wheeler's bluegrass, skyline bluegrass, sedge, limber pine

Typical profile:

Surface rock fragments: About 5 percent subangular stones, 10 percent subangular cobbles, 60 percent subangular gravel

Layer 1—0 to 3 inches; very gravelly fine sandy loam

Layer 2—3 to 13 inches; extremely gravelly fine sandy loam

Layer 3—13 to 23 inches; bedrock

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.0 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY081NV

Component Description

Rock outcrop

Landform: Backslopes of mountains

Slope: 50 to 100 percent, all aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Rubble land

Composition: 0 to 6 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Ecological site: None

Piar and similar soils

Composition: 0 to 4 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—other perennial grasses, gooseberry currant, needlegrass, mountain brome, Ross' sedge, slender wheatgrass, skyline bluegrass, muttongrass, quaking aspen, other perennial forbs, common juniper, other trees, Engelmann's spruce, limber pine

Ecological site: F028AY083NV

Timmercreek family and similar soils

Composition: 0 to 3 percent

Classification: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—mountain snowberry, nodding brome, quaking aspen, mountain brome, slender wheatgrass, other perennial grasses, other perennial forbs, other shrubs, mountain big sagebrush
Ecological site: R028AY073NV—Aspen Thicket

Windwash and similar soils

Composition: 0 to 2 percent

Slope: 15 to 50 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Typical vegetation: Dunhead sedge, Ross' sedge, slender wheatgrass, muttongrass, timberline bluegrass, other shrubs, wax currant, other perennial forbs, other perennial grasses, Wheeler bluegrass

Ecological site: R028AY071NV—Alpine Slope

5255—Wayhigh very gravelly fine sandy loam, 2 to 15 percent slopes

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 11,100 to 11,300

Precipitation: 20 to 28 inches

Air temperature: 34 to 37 degrees Fahrenheit

Frost-free period: 20 to 40 days

Note: This map unit is defined for unique areas of small extent. Due to their small size, these areas are identified by labeled points, rather than by traditional soil polygons.

Composition

Wayhigh very gravelly fine sandy loam, 2 to 15 percent slopes—90 percent

Windwash extremely gravelly loamy coarse sand, 15 to 50 percent slopes—6 percent

Wheelerpek extremely gravelly loam, 30 to 75 percent slopes—4 percent

Component Description

Wayhigh and similar soils

Landform: Summits of mountains; Shoulders of mountains

Slope: 2 to 15 percent, all aspects

Parent material: Colluvium derived from quartzite and residuum weathered from quartzite

Typical vegetation: Other shrubs, dunhead sedge, Ross' sedge, Wheeler's bluegrass, other perennial grasses, cushion phlox, other perennial forbs

Typical profile:

Surface rock fragments: About 30 percent subangular gravel

Layer 1—0 to 3 inches; moderately decomposed plant material

Layer 2—3 to 8 inches; very gravelly fine sandy loam

Layer 3—8 to 35 inches; very gravelly fine sandy loam

Layer 4—35 to 45 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 20 to 39 inches

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately Rapid)
 Available water capacity: About 2 inches
 Present flooding: None
 Present ponding: None
 Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s
 Ecological site: R028AY129NV—Alpine Meadow

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Windwash and similar soils
 Composition: 0 to 6 percent
 Slope: 15 to 50 percent, east to northwest aspects
 Landform: Shoulders of mountains; Summits of mountains
 Typical vegetation: Engelmann's spruce, dunhead sedge, Ross' sedge, alpine fescue, timberline bluegrass, Wheeler bluegrass, other perennial forbs
 Ecological site: R028AY070NV—Calcareous Alpine Ridge

Wheelerpek and similar soils
 Composition: 0 to 4 percent
 Slope: 30 to 75 percent, northwest to east aspects
 Landform: Summits of mountains; Backslopes of mountains; Shoulders of mountains
 Typical vegetation: Ross' sedge, dunhead sedge, alpine fescue, bluegrass, Wheeler bluegrass, other perennial forbs, Engelmann's spruce
 Ecological site: R028AY069NV—Alpine Ridge

5261—Jonlake-Badhap-Berrycreek association

Map Unit Setting

MLRA: 28A
 Landscape: Mountains
 Elevation: 7,810 to 10,500
 Precipitation: 16 to 37 inches
 Air temperature: 35 to 43 degrees Fahrenheit
 Frost-free period: 30 to 60 days

Composition

Jonlake extremely gravelly loam, 30 to 75 percent slopes—45 percent
 Badhap very stony loam, 15 to 50 percent slopes—25 percent
 Berrycreek very gravelly loam, 15 to 50 percent slopes—15 percent
 Topeki extremely gravelly loam, 15 to 50 percent slopes—6 percent
 Badhap very gravelly loam, 15 to 50 percent slopes—4 percent
 Rock outcrop, 15 to 50 percent slopes—2 percent
 Rippo very cobbly loam, 8 to 15 percent slopes—2 percent
 Brokit very stony highly organic loam, 4 to 8 percent slopes—1 percent

Component Description

Jonlake and similar soils
 Landform: Backslopes of mountains
 Slope: 30 to 75 percent, all aspects
 Parent material: Colluvium and residuum derived from quartzite with local mixtures of argillite

Typical vegetation: Muttongrass, other perennial grasses, bluebunch wheatgrass, needlegrass, other shrubs, low sagebrush, other perennial forbs

Typical profile:

Surface rock fragments: About 20 percent angular cobbles, 2 percent angular stones, 40 percent angular gravel

Layer 1—0 to 14 inches; extremely gravelly loam

Layer 2—14 to 17 inches; extremely gravelly loam

Layer 3—17 to 21 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 12 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY061NV—Claypan 14+ P.Z.

Component Description

Badhap and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, east to northwest aspects

Parent material: Colluvium and residuum derived from quartzite

Typical vegetation: Other perennial forbs, mountain big sagebrush, other perennial grasses, other shrubs, mountain snowberry, muttongrass, bluebunch wheatgrass

Typical profile:

Layer 1—0 to 3 inches; very stony loam

Layer 2—3 to 44 inches; extremely cobbly loam

Layer 3—44 to 60 inches; extremely cobbly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Component Description

Berrycreek and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, northwest to east aspects

Parent material: Colluvium and residuum weathered from quartzite

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—Nevada bluegrass, skyline bluegrass, slender wheatgrass, mountain brome, other trees, mountain snowberry, other perennial forbs, white fir, Utah serviceberry, other shrubs, Oregon grape, willow, quaking aspen, Engelmann's spruce

Site index: Engelmann's spruce—65 at an age base of 100 years

Site index: Quaking aspen—45 at an age base of 50 years

Typical profile:

Surface rock fragments: About 35 percent angular gravel

Layer 1—0 to 2 inches; moderately decomposed plant material

Layer 2—2 to 13 inches; very gravelly loam

Layer 3—13 to 60 inches; extremely gravelly sandy clay loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY078NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Topeki and similar soils

Composition: 0 to 6 percent

Slope: 15 to 50 percent, east to northwest aspects

Landform: Shoulders of mountains; Summits of mountains

Typical vegetation: Other perennial forbs, bluebunch wheatgrass, Letterman needlegrass, curlleaf mountain mahogany, mountain big sagebrush

Ecological site: R028AY058NV—Stony Mahogany Savanna

Badhap and similar soils

Composition: 0 to 4 percent

Slope: 15 to 50 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Bluebunch wheatgrass, mountain brome, Utah serviceberry, mountain big sagebrush, other shrubs, mountain snowberry, other perennial grasses, slender wheatgrass, other perennial forbs, nodding brome, needlegrass

Ecological site: R028AY068NV—Loamy Slope 16+ P.Z.

Rock outcrop

Composition: 0 to 2 percent

Slope: 15 to 50 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Ecological site: None

Rippo and similar soils

Composition: 0 to 2 percent

Slope: 8 to 15 percent, all aspects

Landform: Drainageways

Typical vegetation: Forest canopy—Ponderosa pine

Forest understory—other trees, other perennial forbs, Woods' rose, Baltic rush, beardless wildrye, Kentucky bluegrass, other perennial grasses, Booth's willow, Ponderosa pine, water birch, other shrubs

Ecological site: F028AY128NV

Brokit and similar soils

Composition: 0 to 1 percent

Slope: 4 to 8 percent, all aspects

Landform: Stream terraces

Typical vegetation: Forest canopy—quaking aspen

Forest understory—other shrubs, willow, other perennial forbs, other perennial grasses, other trees, Nevada bluegrass, rush, slender wheatgrass, mountain snowberry, white fir, skyline bluegrass, sedge, quaking aspen

Ecological site: F028AY056NV

5270—Bakerpeak-Canyoung-Rock outcrop association

Map Unit Setting

MLRA: 28A

Landscape: None assigned

Elevation: 7,220 to 10,900

Precipitation: 18 to 28 inches

Air temperature: 37 to 43 degrees Fahrenheit

Frost-free period: 40 to 60 days

Composition

Bakerpeak very gravelly loam, 30 to 75 percent slopes—40 percent

Canyoung extremely gravelly loam, 15 to 50 percent slopes—35 percent

Rock outcrop, 50 to 100 percent slopes—15 percent

Hardol very gravelly silt loam, 30 to 75 percent slopes—3 percent

Timmercreek family very gravelly loam, 8 to 30 percent slopes—2 percent

Bricone very gravelly fine sandy loam, 30 to 75 percent slopes—2 percent

Wardbay extremely gravelly loam, 15 to 30 percent slopes—1 percent

Brokit very stony highly organic loam, 4 to 8 percent slopes—1 percent

Ripcon gravelly loam, 2 to 8 percent slopes—1 percent

Component Description

Bakerpeak and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Colluvium derived from limestone and shale

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—Rocky Mountain Douglas fir, sedge, skyline bluegrass, muttongrass, other perennial grasses, other perennial forbs, common juniper, other trees, quaking aspen, white fir, mountain snowberry, other shrubs, Oregon grape

Site index: Douglas fir—40 at an age base of 50 years

Site index: White fir—42 at an age base of 50 years

Typical profile:

Surface rock fragments: About 1 percent subangular stones, 2 percent subangular cobbles, 70 percent subangular gravel

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 5 inches; very gravelly loam
 Layer 3—5 to 13 inches; extremely gravelly loam
 Layer 4—13 to 61 inches; extremely gravelly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High
 Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)
 Available water capacity: About 4 inches
 Present flooding: None
 Present ponding: None
 Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s
 Ecological site: F028AY080NV

Component Description

Canyoung and similar soils
 Landform: Backslopes of mountains
 Slope: 15 to 50 percent, east to northwest aspects
 Parent material: Colluvium derived from limestone, dolomite and calcareous shale
 Typical vegetation: Bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, curleaf mountainmahogany, muttongrass, needlegrass, other perennial grasses

Typical profile:

Surface rock fragments: About 30 percent fine subangular gravel, 30 percent subangular gravel, 5 percent subangular cobbles, 1 percent subangular stones
 Layer 1—0 to 12 inches; extremely gravelly loam
 Layer 2—12 to 60 inches; extremely gravelly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High
 Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)
 Available water capacity: About 3 inches
 Present flooding: None
 Present ponding: None
 Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s
 Ecological site: R028AY059NV—Mahogany Savanna

Component Description

Rock outcrop
 Landform: Summits of mountains; Shoulders of mountains
 Slope: 50 to 100 percent, all aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Hardol and similar soils
 Composition: 0 to 3 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Needlegrass, other shrubs, curlleaf mountainmahogany, other perennial forbs, other perennial grasses, other trees, mountain snowberry

Ecological site: R028AY060NV—Mahogany Thicket

Timmercrek family and similar soils

Composition: 0 to 2 percent

Classification: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Slope: 8 to 30 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—mountain brome, slender wheatgrass, other perennial grasses, other perennial forbs, nodding brome, quaking aspen, mountain snowberry, other shrubs, mountain big sagebrush

Ecological site: R028AY073NV—Aspen Thicket

Bricone and similar soils

Composition: 0 to 2 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Great Basin bristlecone pine, limber pine

Forest understory—sedge, Wheeler's bluegrass, limber pine, other shrubs, currant, other perennial forbs, whitestem goldenbush, skyline bluegrass, common juniper, Great Basin bristlecone pine, other perennial grasses

Ecological site: F028AY081NV

Wardbay and similar soils

Composition: 0 to 1 percent

Slope: 15 to 30 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Muttongrass, other perennial grasses, other perennial forbs, mountain big sagebrush, bluebunch wheatgrass, other shrubs, mountain snowberry

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Brokit and similar soils

Composition: 0 to 1 percent

Slope: 4 to 8 percent, all aspects

Landform: Stream terraces

Typical vegetation: Forest canopy—quaking aspen

Forest understory—sedge, slender wheatgrass, rush, skyline bluegrass, Nevada bluegrass, other perennial grasses, other perennial forbs, other trees, other shrubs, willow, quaking aspen, mountain snowberry, white fir

Ecological site: F028AY056NV

Ripcon and similar soils

Composition: 0 to 1 percent

Slope: 2 to 8 percent, all aspects

Landform: Drainageways

Typical vegetation: Forest canopy—narrowleaf cottonwood

Forest understory—willow, sedge, slender wheatgrass, rush, other perennial grasses, other perennial forbs, skunkbush sumac, basin wildrye, other shrubs, bluegrass, narrowleaf cottonwood, water birch

Ecological site: F028AY079NV

5290—Keyole-Osditch-Topeki association*Map Unit Setting*

MLRA: 28A

Landscape: Mountains

Elevation: 8,140 to 11,600

Precipitation: 18 to 37 inches

Air temperature: 35 to 43 degrees Fahrenheit

Frost-free period: 30 to 60 days

Composition

Keyole extremely gravelly sandy loam, 50 to 75 percent slopes—40 percent

Osditch extremely stony loam, 30 to 75 percent slopes—25 percent

Topeki extremely gravelly loam, 30 to 50 percent slopes—20 percent

Rubble land, 50 to 100 percent slopes—5 percent

Keyole extremely gravelly sandy loam, 30 to 75 percent slopes—4 percent

Wheelerpek extremely gravelly loam, 15 to 50 percent slopes—3 percent

Berry creek very gravelly loam, 15 to 50 percent slopes—1 percent

Brokit very stony highly organic loam, 4 to 8 percent slopes—1 percent

Timmer creek family very gravelly loam, 30 to 75 percent slopes—1 percent

Component Description

Keyole and similar soils

Landform: Backslopes of mountains (Fig. 16)

Slope: 50 to 75 percent, northwest to east aspects

Parent material: Colluvium derived from quartzite

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—mountain brome, needlegrass, other trees, quaking aspen, limber pine, Engelmann's spruce, gooseberry currant, common juniper, other perennial forbs, other perennial grasses, muttongrass, Ross' sedge, skyline bluegrass, slender wheatgrass

Site index: Engelmann's spruce—30 at an age base of 100 years

Typical profile:

Surface rock fragments: About 15 percent angular stones, 20 percent angular cobbles, 50 percent angular gravel

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 5 inches; extremely gravelly sandy loam

Layer 3—5 to 18 inches; extremely gravelly coarse sandy loam

Layer 4—18 to 60 inches; gravel

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: F028AY083NV

Component Description

Osditch and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Colluvium derived from quartzite and argillite



Figure 16—Keyole soils are on very steep, northerly aspects of mountains.

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—other perennial grasses, other perennial forbs, common juniper, Oregon grape, other shrubs, skyline bluegrass, muttongrass, quaking aspen, Rocky Mountain Douglas fir, other trees, mountain snowberry, white fir, sedge

Site index: Douglas fir—40 at an age base of 50 years

Site index: White fir—42 at an age base of 50 years

Typical profile:

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 3 inches; extremely stony loam

Layer 3—3 to 18 inches; extremely cobbly loam

Layer 4—18 to 60 inches; extremely stony sandy loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)
Available water capacity: About 4 inches
Present flooding: None
Present ponding: None
Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s
Ecological site: F028AY080NV

Component Description

Topeki and similar soils
Landform: Shoulders of mountains; Summits of mountains
Slope: 30 to 50 percent, east to northwest aspects
Parent material: Colluvium and residuum derived from quartzite
Typical vegetation: Mountain big sagebrush, curlleaf mountainmahogany, Letterman needlegrass, other perennial forbs, bluebunch wheatgrass

Typical profile:

Surface rock fragments: About 3 percent subangular boulders, 20 percent subangular stones, 20 percent subangular cobbles, 20 percent subangular gravel
Layer 1—0 to 12 inches; extremely gravelly loam
Layer 2—12 to 15 inches; extremely stony loam
Layer 3—15 to 25 inches; bedrock

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Very high
Depth to restrictive feature: Lithic bedrock: 10 to 20 inches
Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)
Available water capacity: About 1.2 inches
Present flooding: None
Present ponding: None
Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s
Ecological site: R028AY058NV—Stony Mahogany Savanna

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Rubble land
Composition: 0 to 5 percent
Slope: 50 to 100 percent, all aspects
Landform: Shoulders of mountains; Backslopes of mountains
Ecological site: None

Keyole and similar soils
Composition: 0 to 4 percent
Slope: 30 to 75 percent, northwest to east aspects
Landform: Backslopes of mountains
Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—quaking aspen, limber pine, mountain snowberry, American red raspberry, other perennial forbs, gooseberry currant, other perennial grasses, white fir, needlegrass, mountain brome, Ross' sedge, skyline bluegrass, Engelmann's spruce
Ecological site: F028AY084NV

Wheelerpek and similar soils

Composition: 0 to 3 percent

Slope: 15 to 50 percent, all aspects

Landform: Summits of higher elevation mountains; Shoulders of higher elevation mountains

Typical vegetation: Engelmann's spruce, dunhead sedge, Ross' sedge, alpine fescue, bluegrass, Wheeler bluegrass, other perennial forbs

Ecological site: R028AY069NV—Alpine Ridge

Berrycreek and similar soils

Composition: 0 to 1 percent

Slope: 15 to 50 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—slender wheatgrass, mountain snowberry, other shrubs, willow, Oregon grape, Utah serviceberry, other perennial forbs, Nevada bluegrass, skyline bluegrass, mountain brome, white fir, Engelmann's spruce, other trees, quaking aspen

Ecological site: F028AY078NV

Brokit and similar soils

Composition: 0 to 1 percent

Slope: 4 to 8 percent, northwest to east aspects

Landform: Stream terraces

Typical vegetation: Forest canopy—quaking aspen

Forest understory—white fir, mountain snowberry, other shrubs, willow, other perennial forbs, other perennial grasses, Nevada bluegrass, skyline bluegrass, quaking aspen, other trees, sedge, slender wheatgrass, rush

Ecological site: F028AY056NV

Timmercreek family and similar soils

Composition: 0 to 1 percent

Classification: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—nodding brome, mountain brome, slender wheatgrass, other perennial grasses, other perennial forbs, quaking aspen, mountain snowberry, other shrubs, mountain big sagebrush

Ecological site: R028AY073NV—Aspen Thicket

5291—Keyole-Rubble land association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 8,760 to 11,600

Precipitation: 24 to 37 inches

Air temperature: 35 to 39 degrees Fahrenheit

Frost-free period: 30 to 50 days

Composition

Keyole extremely gravelly sandy loam, 30 to 75 percent slopes—50 percent
 Rubble land, 50 to 100 percent slopes—35 percent
 Wheelerpek extremely gravelly loam, 15 to 50 percent slopes—6 percent
 Keyole extremely gravelly sandy loam, 30 to 75 percent slopes—5 percent
 Rock outcrop, 50 to 100 percent slopes—4 percent

Component Description

Keyole and similar soils
 Landform: Backslopes of mountains
 Slope: 30 to 75 percent, northwest to east aspects
 Parent material: Colluvium derived from quartzite
 Typical vegetation: Forest canopy—Engelmann's spruce
 Forest understory—other trees, mountain brome, needlegrass, gooseberry currant, common juniper, quaking aspen, limber pine, Engelmann's spruce, other perennial forbs, other perennial grasses, muttongrass, skyline bluegrass, Ross' sedge, slender wheatgrass
 Site index: Engelmann's spruce—30 at an age base of 100 years

Typical profile:

Surface rock fragments: About 50 percent angular gravel, 20 percent angular cobbles, 15 percent angular stones
 Layer 1—0 to 1 inch; slightly decomposed plant material
 Layer 2—1 to 5 inches; extremely gravelly sandy loam
 Layer 3—5 to 18 inches; extremely gravelly coarse sandy loam
 Layer 4—18 to 60 inches; gravel

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium
 Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)
 Available water capacity: About 3 inches
 Present flooding: None
 Present ponding: None
 Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s
 Ecological site: F028AY083NV

Component Description

Rubble land
 Landform: Backslopes of mountains
 Slope: 50 to 100 percent, all aspects

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Wheelerpek and similar soils
 Composition: 0 to 6 percent
 Slope: 15 to 50 percent, all aspects
 Landform: Shoulders of mountains; Summits of mountains
 Typical vegetation: Engelmann's spruce, other perennial forbs, dunhead sedge, bluegrass, alpine fescue, Ross' sedge, Wheeler bluegrass
 Ecological site: R028AY069NV—Alpine Ridge

Keyole and similar soils

Composition: 0 to 5 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—mountain snowberry, gooseberry currant, American red raspberry, other perennial grasses, skyline bluegrass, Ross' sedge, mountain brome, quaking aspen, limber pine, Engelmann's spruce, other perennial forbs, white fir, needlegrass

Ecological site: F028AY084NV

Rock outcrop

Composition: 0 to 4 percent

Slope: 50 to 100 percent, all aspects

Landform: Summits of mountains; Shoulders of mountains

Ecological site: None

5292—Keyole-Osditch association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 7,380 to 11,200

Precipitation: 18 to 37 inches

Air temperature: 35 to 43 degrees Fahrenheit

Frost-free period: 30 to 60 days

Composition

Keyole extremely gravelly sandy loam, 15 to 75 percent slopes—50 percent

Osditch extremely stony loam, 30 to 75 percent slopes—35 percent

Berrycreek very gravelly loam, 50 to 75 percent slopes—5 percent

Keyole extremely gravelly sandy loam, 50 to 75 percent slopes—5 percent

Topeki extremely gravelly loam, 30 to 75 percent slopes—3 percent

Rock outcrop, 30 to 75 percent slopes—2 percent

Component Description

Keyole and similar soils

Landform: Backslopes of mountains

Slope: 15 to 75 percent, northwest to east aspects

Parent material: Colluvium derived from quartzite

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—muttongrass, skyline bluegrass, common juniper, other perennial forbs, gooseberry currant, Ross' sedge, other perennial grasses, quaking aspen, slender wheatgrass, limber pine, Engelmann's spruce, mountain brome, needlegrass, other trees

Site index: Engelmann's spruce—30 at an age base of 100 years

Typical profile:

Surface rock fragments: About 20 percent angular cobbles, 15 percent angular stones, 50 percent angular gravel

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 5 inches; extremely gravelly sandy loam

Layer 3—5 to 18 inches; extremely gravelly coarse sandy loam

Layer 4—18 to 60 inches; gravel

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: F028AY083NV

Component Description

Osditch and similar soils

Landform: Backslopes of lower elevation mountains

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Colluvium derived from quartzite and argillite

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—other perennial forbs, Oregongrape, other perennial grasses, muttongrass, skyline bluegrass, sedge, common juniper, white fir, quaking aspen, other shrubs, mountain snowberry, other trees, Rocky Mountain Douglas fir

Site index: Douglas fir—40 at an age base of 50 years

Site index: White fir—42 at an age base of 50 years

Typical profile:

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 3 inches; extremely stony loam

Layer 3—3 to 18 inches; extremely cobbly loam

Layer 4—18 to 60 inches; extremely stony sandy loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: F028AY080NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Berrycreek and similar soils

Composition: 0 to 5 percent

Slope: 50 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—quaking aspen, other trees, Engelmann's spruce, white fir, mountain snowberry, other shrubs, willow, Oregongrape, Utah serviceberry, other perennial forbs, mountain brome, Nevada bluegrass, skyline bluegrass, slender wheatgrass

Ecological site: F028AY078NV

Keyole and similar soils

Composition: 0 to 5 percent

Slope: 50 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—mountain brome, other perennial grasses, other perennial forbs, gooseberry currant, American red raspberry, Engelmann's spruce, needlegrass, white fir, mountain snowberry, quaking aspen, Ross' sedge, skyline bluegrass, limber pine

Ecological site: F028AY084NV

Topeki and similar soils

Composition: 0 to 3 percent

Slope: 30 to 75 percent, east to northwest aspects

Landform: Shoulders of mountains; Summits of mountains

Typical vegetation: Letterman needlegrass, bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, curleaf mountainmahogany

Ecological site: R028AY058NV—Stony Mahogany Savanna

Rock outcrop

Composition: 0 to 2 percent

Slope: 30 to 75 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Ecological site: None

5310—Jumble-Lemcave association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 8,270 to 10,600

Precipitation: 18 to 37 inches

Air temperature: 35 to 43 degrees Fahrenheit

Frost-free period: 30 to 60 days

Composition

Jumble extremely stony loam, 8 to 50 percent slopes—55 percent

Lemcave extremely gravelly sandy loam, 8 to 50 percent slopes—30 percent

Ceebee very stony highly organic loam, 30 to 75 percent slopes—7 percent

Timmercreek very gravelly highly organic loam, 15 to 50 percent slopes—6 percent

Brokit very stony highly organic loam, 4 to 8 percent slopes—2 percent

Component Description

Jumble and similar soils

Landform: Backslopes of higher elevation moraines

Slope: 8 to 50 percent, all aspects

Parent material: Till derived from quartzite

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—mountain brome, Ross' sedge, slender wheatgrass, other trees, quaking aspen, limber pine, Engelmann's spruce, gooseberry currant, needlegrass, skyline bluegrass, muttongrass, other perennial grasses, other perennial forbs, common juniper

Site index: Engelmann's spruce—30 at an age base of 100 years

Typical profile:

Surface rock fragments: About 2 percent angular boulders, 15 percent angular stones, 20 percent angular gravel, 20 percent angular cobbles

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 6 inches; extremely stony loam

Layer 3—6 to 19 inches; extremely cobbly sandy loam

Layer 4—19 to 61 inches; extremely cobbly sandy loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: F028AY083NV

Component Description

Lemcave and similar soils

Landform: Backslopes of lower elevation moraines

Slope: 8 to 50 percent, all aspects

Parent material: Till and outwash derived dominantly from quartzite and small amounts of granite

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—quaking aspen, white fir, mountain snowberry, other shrubs, common juniper, Rocky Mountain Douglas fir, muttongrass, skyline bluegrass, sedge, other trees, other perennial forbs, other perennial grasses, Oregongrape

Site index: Douglas fir—40 at an age base of 50 years

Site index: White fir—42 at an age base of 50 years

Typical profile:

Surface rock fragments: About 10 percent subrounded stones, 5 percent subrounded boulders, 25 percent subrounded gravel, 15 percent subrounded cobbles

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 8 inches; extremely gravelly sandy loam

Layer 3—8 to 30 inches; extremely cobbly loamy coarse sand

Layer 4—30 to 61 inches; extremely cobbly loamy coarse sand

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: F028AY080NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Ceebee and similar soils

Composition: 0 to 7 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—mountain snowberry, mountain brome, quaking aspen, needlegrass, limber pine, Ross' sedge, skyline bluegrass, other perennial grasses, other perennial forbs, gooseberry currant, American red raspberry, white fir, Engelmann's spruce

Ecological site: F028AY084NV

Timmercreek and similar soils

Composition: 0 to 6 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of higher elevation ground moraines

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—skyline bluegrass, Nevada bluegrass, mountain brome, other perennial forbs, Utah serviceberry, Oregon grape, willow, mountain snowberry, Engelmann's spruce, slender wheatgrass, other trees, other shrubs, white fir, quaking aspen

Ecological site: F028AY078NV

Brokit and similar soils

Composition: 0 to 2 percent

Slope: 4 to 8 percent, all aspects

Landform: Stream terraces

Typical vegetation: Forest canopy—quaking aspen

Forest understory—other trees, quaking aspen, white fir, mountain snowberry, sedge, other shrubs, willow, other perennial forbs, other perennial grasses, Nevada bluegrass, slender wheatgrass, rush, skyline bluegrass

Ecological site: F028AY056NV

5311—Jumble-Lemcave-Gaia association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 7,810 to 11,000

Precipitation: 18 to 37 inches

Air temperature: 35 to 43 degrees Fahrenheit

Frost-free period: 30 to 60 days

Composition

Jumble extremely stony loam, 8 to 50 percent slopes—40 percent

Lemcave extremely gravelly sandy loam, 8 to 50 percent slopes—30 percent

Gaia extremely gravelly loam, 15 to 50 percent slopes—15 percent

Ceebee very stony highly organic loam, 30 to 75 percent slopes—4 percent

Brokit very stony highly organic loam, 8 to 30 percent slopes—3 percent

Rubble land, 15 to 50 percent slopes—2 percent

Badhap very gravelly loam, 15 to 50 percent slopes—2 percent

Guiser extremely cobbly loam, 15 to 50 percent slopes—1 percent

Piar very gravelly loam, 15 to 50 percent slopes—1 percent

Timmercreek family very gravelly loam, 30 to 75 percent slopes—1 percent

Lehmandow loam, 0 to 2 percent slopes—1 percent

Component Description

Jumble and similar soils

Landform: Backslopes of higher elevation moraines

Slope: 8 to 50 percent, northwest to east aspects

Parent material: Till derived from quartzite

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—Engelmann's spruce, common juniper, other perennial forbs, other perennial grasses, muttongrass, skyline bluegrass, limber pine, quaking aspen, other trees, gooseberry currant, slender wheatgrass, Ross' sedge, needlegrass, mountain brome

Site index: Engelmann's spruce—30 at an age base of 100 years

Typical profile:

Surface rock fragments: About 20 percent angular cobbles, 20 percent angular gravel, 15 percent angular stones, 2 percent angular boulders

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 6 inches; extremely stony loam

Layer 3—6 to 19 inches; extremely cobbly sandy loam

Layer 4—19 to 61 inches; extremely cobbly sandy loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: F028AY083NV

Component Description

Lemcave and similar soils

Landform: Backslopes of lower elevation moraines (Fig. 17)

Slope: 8 to 50 percent, east to northwest aspects

Parent material: Till and outwash derived dominantly from quartzite and small amounts of granite

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—other trees, Rocky Mountain Douglas fir, mountain snowberry, quaking aspen, other shrubs, Oregon grape, common juniper, other perennial forbs, other perennial grasses, muttongrass, skyline bluegrass, sedge, white fir

Site index: Douglas fir—40 at an age base of 50 years

Site index: White fir—42 at an age base of 50 years

Typical profile:

Surface rock fragments: About 25 percent subrounded gravel, 10 percent subrounded stones, 5 percent subrounded boulders, 15 percent subrounded cobbles

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 8 inches; extremely gravelly sandy loam

Layer 3—8 to 30 inches; extremely cobbly loamy coarse sand

Layer 4—30 to 61 inches; extremely cobbly loamy coarse sand

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained



Figure 17— Lemcave soils are on the northerly aspects of lower elevation moraines.

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: F028AY080NV

Component Description

Gaia and similar soils

Landform: Backslopes of lower elevation ground moraines

Slope: 15 to 50 percent, east to northwest aspects

Parent material: Till derived dominantly from quartzite and minor amounts of granite

Typical vegetation: Other perennial forbs, muttongrass, other perennial grasses, curleaf mountainmahogany, bluebunch wheatgrass, needlegrass, mountain big sagebrush

Typical profile:

Surface rock fragments: About 5 percent rounded cobbles, 30 percent rounded gravel, 15 percent rounded stones

Layer 1—0 to 11 inches; extremely gravelly loam

Layer 2—11 to 60 inches; extremely cobbly sandy loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY059NV—Mahogany Savanna

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Ceebee and similar soils

Composition: 0 to 4 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—quaking aspen, limber pine, other perennial forbs, gooseberry currant, snowberry, Engelmann's spruce, white fir, other perennial grasses, skyline bluegrass, Ross' sedge, needlegrass, American red raspberry, mountain brome

Ecological site: F028AY084NV

Brokit and similar soils

Composition: 0 to 3 percent

Slope: 8 to 30 percent, all aspects

Landform: Toeslopes of stream terraces

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—mountain snowberry, other shrubs, other trees, quaking aspen, Engelmann's spruce, white fir, willow, Oregon grape, Utah serviceberry, other perennial forbs, mountain brome, slender wheatgrass, skyline bluegrass, Nevada bluegrass

Ecological site: F028AY078NV

Rubble land

Composition: 0 to 2 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of ground moraines

Ecological site: None

Badhap and similar soils

Composition: 0 to 2 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Other shrubs, mountain big sagebrush, other perennial forbs, bluebunch wheatgrass, other perennial grasses, slender wheatgrass, mountain brome, nodding brome, needlegrass, Utah serviceberry

Ecological site: R028AY068NV—Loamy Slope 16+ P.Z.

Guiser and similar soils

Composition: 0 to 1 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Great Basin bristlecone pine, limber pine

Forest understory—skyline bluegrass, Great Basin bristlecone pine, other perennial grasses, other perennial forbs, whitestem goldenbush, limber pine, other shrubs, currant, sedge, Wheeler's bluegrass, common juniper

Ecological site: F028AY081NV

Piar and similar soils

Composition: 0 to 1 percent

Slope: 15 to 50 percent, east to south aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce, limber pine

Forest understory—Engelmann's spruce, needlegrass, mountain brome, Ross' sedge, slender wheatgrass, skyline bluegrass, muttongrass, other perennial grasses, other perennial forbs, common juniper, gooseberry currant, other trees, limber pine, quaking aspen

Ecological site: F028AY083NV

Timmercrek family and similar soils

Composition: 0 to 1 percent

Classification: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—other perennial forbs, mountain big sagebrush, other shrubs, mountain snowberry, quaking aspen, nodding brome, mountain brome, slender wheatgrass, other perennial grasses

Ecological site: R028AY073NV—Aspen Thicket

Lehmandow and similar soils

Composition: 0 to 1 percent

Slope: 0 to 2 percent, all aspects

Landform: Stream terraces

Typical vegetation: Alpine timothy, Nevada bluegrass, other perennial grasses, other perennial forbs, other shrubs, Shrubby cinquefoil, tufted hairgrass, sedge

Ecological site: R028AY072NV—Wet Meadow

5320—Wardbay-Basinpeak association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 8,070 to 10,400

Precipitation: 18 to 28 inches

Air temperature: 36 to 43 degrees Fahrenheit

Frost-free period: 40 to 60 days

Composition

Wardbay extremely gravelly loam, 30 to 75 percent slopes—40 percent

Wardbay extremely gravelly loam, convex slopes, 30 to 75 percent slopes—30 percent

Basinpeak very gravelly loam, 15 to 50 percent slopes—20 percent

Canyoung extremely gravelly loam, 15 to 50 percent slopes—5 percent
 Rock outcrop, 30 to 75 percent slopes—3 percent
 Timmercrek family very gravelly loam, 30 to 75 percent slopes—2 percent

Component Description

Wardbay and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Bluebunch wheatgrass, basin wildrye, other perennial grasses, mountain snowberry, other perennial forbs, muttongrass, other shrubs, mountain big sagebrush

Typical profile:

Surface rock fragments: About 20 percent subangular gravel

Layer 1—0 to 18 inches; extremely gravelly loam

Layer 2—18 to 42 inches; extremely cobbly silt loam

Layer 3—42 to 52 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 39 to 60 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8e

Ecological site: R028AY067NV—Calcareous Loam 14+ P.Z.

Component Description

Wardbay convex slopes and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, east to northwest aspects

Parent material: Residuum and colluvium derived from limestone and dolomite

Typical vegetation: Mountain big sagebrush, muttongrass, other perennial grasses, other perennial forbs, mountain snowberry, other shrubs, bluebunch wheatgrass

Typical profile:

Surface rock fragments: About 20 percent subangular gravel

Layer 1—0 to 18 inches; extremely gravelly loam

Layer 2—18 to 42 inches; extremely cobbly silt loam

Layer 3—42 to 52 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 39 to 60 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8e

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Component Description

Basinpeak and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, all aspects

Parent material: Colluvium derived from limestone and residuum weathered from limestone

Typical vegetation: Muttongrass, other shrubs, low sagebrush, other perennial forbs, bluebunch wheatgrass, other perennial grasses, needlegrass

Typical profile:

Surface rock fragments: About 5 percent cobbles, 10 percent stones, 30 percent gravel

Layer 1—0 to 11 inches; very gravelly loam

Layer 2—11 to 60 inches; extremely gravelly loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY061NV—Claypan 14+ P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Canyoung and similar soils

Composition: 0 to 5 percent

Slope: 15 to 50 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Mountain big sagebrush, curlleaf mountainmahogany, other perennial forbs, other perennial grasses, needlegrass, muttongrass, bluebunch wheatgrass

Ecological site: R028AY059NV—Mahogany Savanna

Rock outcrop

Composition: 0 to 3 percent

Slope: 30 to 75 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Ecological site: None

Timmercreek family and similar soils

Composition: 0 to 2 percent

Classification: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—quaking aspen, mountain snowberry, other shrubs, mountain big sagebrush, other perennial forbs, other perennial grasses, slender wheatgrass, mountain brome, nodding brome

Ecological site: R028AY073NV—Aspen Thicket

5330—Rubble land-Wheelerpek-Cobblywheel association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 9,350 to 13,100

Precipitation: 24 to 43 inches

Air temperature: 32 to 37 degrees Fahrenheit

Frost-free period: 20 to 40 days

Composition

Rubble land, 30 to 75 percent slopes—35 percent

Wheelerpek extremely gravelly loam, 30 to 75 percent slopes—30 percent

Cobblywheel extremely cobbly loam, 15 to 50 percent slopes—25 percent

Rock outcrop, 30 to 100 percent slopes—4 percent

Keyole extremely gravelly sandy loam, 30 to 75 percent slopes—2 percent

Bricone very gravelly fine sandy loam, 30 to 75 percent slopes—2 percent

Wayhigh very gravelly fine sandy loam, 2 to 15 percent slopes—1 percent

Timmercreek family very gravelly loam, 30 to 75 percent slopes—1 percent

Component Description

Rubble land

Landform: Backslopes of mountains; Shoulders of mountains; Summits of mountains

Slope: 30 to 75 percent, all aspects

Component Description

Wheelerpek and similar soils

Landform: Shoulders of mountains; Backslopes of mountains; Summits of mountains

Slope: 30 to 75 percent, all aspects

Parent material: Colluvium and residuum derived from quartzite

Typical vegetation: Dunhead sedge, Ross' sedge, alpine fescue, bluegrass, Wheeler bluegrass, other perennial forbs, Engelmann's spruce

Typical profile:

Surface rock fragments: About 50 percent angular gravel, 15 percent angular stones, 10 percent angular cobbles

Layer 1—0 to 4 inches; extremely gravelly loam

Layer 2—4 to 13 inches; extremely cobbly sandy loam

Layer 3—13 to 17 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 0.9 inch

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY069NV—Alpine Ridge

Component Description

Cobblywheel and similar soils

Landform: Summits of mountains; Backslopes of mountains; Shoulders of mountains (Fig. 18)

Slope: 15 to 50 percent, all aspects

Parent material: Colluvium and solifluction deposits derived from quartzite

Typical vegetation: Dunhead sedge, Ross' sedge, bluegrass, Wheeler bluegrass, other perennial forbs, Engelmann's spruce, alpine fescue



Figure 18—Cobblywheel soils on summits and shoulders of mountains is covered by a high volume of quartzite cobbles and gravel. The sparse plant community is characteristic of the Alpine Ridge ecological site.

Typical profile:

Surface rock fragments: About 5 percent angular boulders, 35 percent angular gravel, 30 percent angular cobbles, 5 percent angular stones

Layer 1—0 to 2 inches; extremely cobbly highly decomposed plant material

Layer 2—2 to 15 inches; extremely cobbly loam

Layer 3—15 to 60 inches; extremely cobbly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY069NV—Alpine Ridge

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Rock outcrop

Composition: 0 to 4 percent

Slope: 30 to 100 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Ecological site: None

Keyole and similar soils

Composition: 0 to 2 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—other perennial grasses, other perennial forbs, gooseberry currant, Engelmann's spruce, Ross' sedge, other trees, limber pine, quaking aspen, slender wheatgrass, mountain brome, needlegrass, muttongrass, skyline bluegrass, common juniper

Ecological site: F028AY083NV

Bricone and similar soils

Composition: 0 to 2 percent

Slope: 30 to 75 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Great Basin bristlecone pine, limber pine

Forest understory—sedge, Wheeler's bluegrass, other perennial grasses, other perennial forbs, whitestem goldenbush, common juniper, currant, other shrubs, limber pine, Great Basin bristlecone pine, skyline bluegrass

Ecological site: F028AY081NV

Wayhigh and similar soils

Composition: 0 to 1 percent

Slope: 2 to 15 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Typical vegetation: Wheeler's bluegrass, other perennial forbs, cushion phlox, Ross' sedge, dunhead sedge, other shrubs, other perennial grasses

Ecological site: R028AY129NV—Alpine Meadow

Timmercrek family and similar soils

Composition: 0 to 1 percent

Classification: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—nodding brome, mountain brome, slender wheatgrass, other perennial grasses, quaking aspen, other perennial forbs, mountain big sagebrush, other shrubs, mountain snowberry

Ecological site: R028AY073NV—Aspen Thicket

5340—Linpeak-Piar-Bricone association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 8,560 to 11,200

Precipitation: 24 to 37 inches

Air temperature: 35 to 39 degrees Fahrenheit

Frost-free period: 30 to 50 days

Composition

Linpeak gravelly loam, 15 to 50 percent slopes—50 percent

Piar very gravelly loam, 30 to 75 percent slopes—20 percent

Bricone very gravelly fine sandy loam, 30 to 75 percent slopes—15 percent

Rubble land, 50 to 100 percent slopes—9 percent

Rock outcrop, 50 to 100 percent slopes—4 percent

Timmercreek family very gravelly loam, 30 to 75 percent slopes—2 percent

Component Description

Linpeak and similar soils

Landform: Backslopes of mountains (Fig. 19)

Slope: 15 to 50 percent, northwest to east aspects

Parent material: Colluvium derived from limestone and calcareous shale

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—mountain snowberry, needlegrass, mountain brome, Ross' sedge, skyline bluegrass, other perennial grasses, other perennial forbs, gooseberry currant, American red raspberry, white fir, Engelmann's spruce, limber pine, quaking aspen

Site index: Engelmann's spruce—53 at an age base of 100 years

Typical profile:

Surface rock fragments: About 30 percent subrounded gravel

Layer 1—0 to 2 inches; slightly decomposed plant material

Layer 2—2 to 3 inches; gravelly loam

Layer 3—3 to 14 inches; very gravelly loam

Layer 4—14 to 32 inches; very gravelly loam

Layer 5—32 to 62 inches; extremely gravelly loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Moderately well drained

Interpretive Groups

Nonirrigated land capability: 7e

Ecological site: F028AY084NV



Figure 19—A view of Linpeak soil on mountain backslopes in areas of limestone geology.

Component Description

Piar and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Colluvium and residuum from limestone and calcareous shale

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—gooseberry currant, mountain brome, Ross' sedge, slender wheatgrass, skyline bluegrass, muttongrass, other perennial grasses, other perennial forbs, common juniper, Engelmann's spruce, limber pine, quaking aspen, other trees, needlegrass

Site index: Engelmann's spruce—30 at an age base of 100 years

Typical profile:

Surface rock fragments: About 40 percent subangular gravel, 1 percent subangular stones, 5 percent subangular cobbles

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 3 inches; very gravelly loam

Layer 3—3 to 13 inches; extremely gravelly loam

Layer 4—13 to 53 inches; extremely gravelly loam

Layer 5—53 to 63 inches; bedrock

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Lithic bedrock: 39 to 59 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches
Present flooding: None
Present ponding: None
Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s
Ecological site: F028AY083NV

Component Description

Bricone and similar soils
Landform: Backslopes of mountains
Slope: 30 to 75 percent, east to northwest aspects
Parent material: Residuum and colluvium derived from limestone and dolomite
Typical vegetation: Forest canopy—Great Basin bristlecone pine, limber pine
Forest understory—Great Basin bristlecone pine, limber pine, sedge, skyline bluegrass, Wheeler's bluegrass, whitestem goldenbush, common juniper, currant, other perennial forbs, other perennial grasses, other shrubs

Typical profile:

Surface rock fragments: About 5 percent subangular stones, 60 percent subangular gravel, 10 percent subangular cobbles
Layer 1—0 to 3 inches; very gravelly fine sandy loam
Layer 2—3 to 13 inches; extremely gravelly fine sandy loam
Layer 3—13 to 23 inches; bedrock

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: High
Depth to restrictive feature: Lithic bedrock: 10 to 20 inches
Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)
Available water capacity: About 1.0 inch
Present flooding: None
Present ponding: None
Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s
Ecological site: F028AY081NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Rubble land
Composition: 0 to 9 percent
Slope: 50 to 100 percent, all aspects
Landform: Backslopes of mountains
Ecological site: None

Rock outcrop
Composition: 0 to 4 percent
Slope: 50 to 100 percent, all aspects
Landform: Shoulders of mountains; Summits of mountains
Ecological site: None

Timmercreek family and similar soils

Composition: 0 to 2 percent

Classification: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—other perennial forbs, nodding brome, mountain brome, slender wheatgrass, other perennial grasses, mountain snowberry, quaking aspen, mountain big sagebrush, other shrubs

Ecological site: R028AY073NV—Aspen Thicket

5350—Goodski-Kious-Snacreek association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 7,120 to 10,500

Precipitation: 18 to 37 inches

Air temperature: 35 to 43 degrees Fahrenheit

Frost-free period: 30 to 60 days

Composition

Goodski very gravelly loam, 8 to 50 percent slopes—35 percent

Kious extremely gravelly loamy coarse sand, 30 to 75 percent slopes—35 percent

Snacreek very gravelly coarse sandy loam, 8 to 50 percent slopes—15 percent

Badhap very gravelly loam, 30 to 75 percent slopes—7 percent

Rock outcrop, 50 to 100 percent slopes—3 percent

Strawbcrek very bouldery coarse sandy loam, 30 to 75 percent slopes—2 percent

Basinpeak very gravelly loam, 15 to 50 percent slopes—2 percent

Lehmandow loam, 0 to 2 percent slopes—1 percent

Component Description

Goodski and similar soils

Landform: Backslopes of mountains

Slope: 8 to 50 percent, all aspects

Parent material: Colluvium and residuum weathered from granite

Typical vegetation: Muttongrass, other perennial grasses, other perennial forbs, mountain big sagebrush, bluebunch wheatgrass, other shrubs, mountain snowberry (Fig. 20)

Typical profile:

Surface rock fragments: About 2 percent angular stones, 5 percent angular cobbles, 50 percent angular gravel

Layer 1—0 to 4 inches; very gravelly loam

Layer 2—4 to 17 inches; very gravelly coarse sandy loam

Layer 3—17 to 28 inches; very gravelly coarse sandy loam

Layer 4—28 to 30 inches; bedrock

Layer 5—30 to 40 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High

Depth to restrictive feature: Paralithic bedrock: 20 to 37 inches; Lithic bedrock: 21 to 39 inches

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 2 inches

Present flooding: None
Present ponding: None
Natural drainage class: Well drained



Figure 20—Goodski soils (foreground) are dominated by mountain big sagebrush. Kious soils occur at the vegetative break where the curleaf mountainmahogany becomes dominant.

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Component Description

Kious and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, east to northwest aspects

Parent material: Colluvium and residuum derived from granite

Typical vegetation: Needlegrass, muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, curleaf mountainmahogany

Typical profile:

Surface rock fragments: About 15 percent angular cobbles, 25 percent angular gravel, 5 percent angular stones

Layer 1—0 to 9 inches; extremely gravelly loamy coarse sand

Layer 2—9 to 19 inches; very gravelly coarse sandy loam

Layer 3—19 to 60 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Paralithic bedrock: 16 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.1 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY059NV—Mahogany Savanna

Component Description

Snacreek and similar soils

Landform: Backslopes of mountains

Slope: 8 to 50 percent, northwest to east aspects

Parent material: Colluvium and residuum from granite

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—Utah serviceberry, other shrubs, mountain brome, slender wheatgrass, skyline bluegrass, Nevada bluegrass, other perennial forbs, Oregon grape, white fir, willow, Engelmann's spruce, other trees, quaking aspen, mountain snowberry

Site index: Engelmann's spruce—65 at an age base of 100 years

Site index: Quaking aspen—45 at an age base of 50 years

Typical profile:

Surface rock fragments: About 35 percent subrounded gravel

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 18 inches; very gravelly coarse sandy loam

Layer 3—18 to 60 inches; extremely gravelly coarse sandy loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Moderately well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY078NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Badhap and similar soils

Composition: 0 to 7 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Mountain big sagebrush, other shrubs, mountain snowberry, Utah serviceberry, bluebunch wheatgrass, other perennial forbs, needlegrass, nodding brome, mountain brome, slender wheatgrass, other perennial grasses

Ecological site: R028AY068NV—Loamy Slope 16+ P.Z.

Rock outcrop

Composition: 0 to 3 percent

Slope: 50 to 100 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Ecological site: None

Strawbcrek and similar soils

Composition: 0 to 2 percent

Slope: 30 to 75 percent, northwest to east aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—Rocky Mountain Douglas fir, quaking aspen, white fir, mountain snowberry, other shrubs, Oregon grape, other trees, common juniper, other perennial forbs, other perennial grasses, sedge, skyline bluegrass, muttongrass

Ecological site: F028AY080NV

Basinpeak and similar soils

Composition: 0 to 2 percent

Slope: 15 to 50 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Low sagebrush, bluebunch wheatgrass, other perennial grasses, muttongrass, other perennial forbs

Ecological site: R028AY062NV—Mountain Ridge

Lehmandow and similar soils

Composition: 0 to 1 percent

Slope: 0 to 2 percent, all aspects

Landform: Stream terraces

Typical vegetation: Other shrubs, Nevada bluegrass, Shrubby cinquefoil, other perennial forbs, other perennial grasses, alpine timothy, tufted hairgrass, sedge

Ecological site: R028AY072NV—Wet Meadow

5380—Ceebee-Strawbcrek association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 7,840 to 10,700

Precipitation: 18 to 37 inches

Air temperature: 35 to 43 degrees Fahrenheit

Frost-free period: 30 to 60 days

Composition

Ceebee very stony loam, 30 to 75 percent slopes—50 percent

Strawbcrek very bouldery coarse sandy loam, 30 to 75 percent slopes—40 percent

Snacreek very gravelly coarse sandy loam, 8 to 50 percent slopes—7 percent

Rock outcrop, 15 to 50 percent slopes—3 percent

Component Description

Ceebee and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Colluvium derived from granite

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—other perennial grasses, skyline bluegrass, Ross' sedge, white fir, other perennial forbs, gooseberry currant, Engelmann's spruce, limber pine, American red raspberry, quaking aspen, mountain snowberry, mountain brome, needlegrass

Site index: Engelmann's spruce—53 at an age base of 100 years

Typical profile:

Surface rock fragments: About 15 percent angular cobbles, 10 percent angular stones, 20 percent angular gravel

Layer 1—0 to 2 inches; slightly decomposed plant material

Layer 2—2 to 10 inches; very stony loam

Layer 3—10 to 24 inches; extremely stony loamy coarse sand

Layer 4—24 to 62 inches; extremely gravelly loamy coarse sand

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 5 inches

Present flooding: None

Present ponding: None

Natural drainage class: Somewhat excessively drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY084NV

Component Description

Strawbcrek and similar soils

Landform: Backslopes of lower elevation mountains (Fig. 21)

Slope: 30 to 75 percent, northwest to east aspects

Parent material: Colluvium derived from granite

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—white fir, mountain snowberry, other shrubs, Oregon grape, common juniper, other trees, quaking aspen, muttongrass, skyline bluegrass, sedge, Rocky Mountain Douglas fir, other perennial forbs, other perennial grasses

Site index: Douglas fir—40 at an age base of 50 years

Site index: White fir—42 at an age base of 50 years

Typical profile:

Surface rock fragments: About 5 percent angular cobbles, 3 percent angular boulders, 35 percent angular gravel, 5 percent angular stones

Layer 1—0 to 2 inches; slightly decomposed plant material

Layer 2—2 to 3 inches; very bouldery coarse sandy loam

Layer 3—3 to 26 inches; extremely gravelly coarse sandy loam

Layer 4—26 to 62 inches; extremely cobbly loamy coarse sand

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 4 inches

Present flooding: None



Figure 21—Strawbcrek soils are on the lower parts of mountain backslopes in this map unit. The upper elevation backslopes (not shown) are dominated by the Ceebee soil component.

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY080NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Snacreek and similar soils

Composition: 0 to 7 percent

Slope: 8 to 50 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—slender wheatgrass, Nevada bluegrass, other perennial forbs, Utah serviceberry, Oregon grape, mountain brome, other shrubs, willow, white fir, mountain snowberry, Engelmann's spruce, quaking aspen, other trees, skyline bluegrass

Ecological site: F028AY078NV

Rock outcrop
 Composition: 0 to 3 percent
 Slope: 15 to 50 percent, all aspects
 Landform: Shoulders of mountains; Summits of mountains
 Ecological site: None

5381—Ceebee-Pirapeak association

Map Unit Setting

MLRA: 28A
 Landscape: Mountains
 Elevation: 9,550 to 11,500
 Precipitation: 24 to 37 inches
 Air temperature: 35 to 39 degrees Fahrenheit
 Frost-free period: 30 to 50 days

Composition

Ceebee very stony loam, 30 to 75 percent slopes—50 percent
 Pirapeak extremely bouldery coarse sandy loam, 30 to 75 percent slopes—40 percent
 Snacreek very gravelly coarse sandy loam, 8 to 50 percent slopes—5 percent
 Rock outcrop, 30 to 75 percent slopes—5 percent

Component Description

Ceebee and similar soils
 Landform: Backslopes of mountains
 Slope: 30 to 75 percent, northwest to east aspects
 Parent material: Colluvium derived from granite
 Typical vegetation: Forest canopy—Engelmann's spruce
 Forest understory—white fir, American red raspberry, needlegrass, mountain brome, Ross' sedge, skyline bluegrass, other perennial grasses, other perennial forbs, Engelmann's spruce, limber pine, quaking aspen, mountain snowberry, gooseberry currant
 Site index: Engelmann's spruce—53 at an age base of 100 years

Typical profile:

Surface rock fragments: About 20 percent angular gravel, 15 percent angular cobbles, 10 percent angular stones
 Layer 1—0 to 2 inches; slightly decomposed plant material
 Layer 2—2 to 10 inches; very stony loam
 Layer 3—10 to 24 inches; extremely stony loamy coarse sand
 Layer 4—24 to 62 inches; extremely gravelly loamy coarse sand

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium
 Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)
 Available water capacity: About 5 inches
 Present flooding: None
 Present ponding: None
 Natural drainage class: Somewhat excessively drained

Interpretive Groups

Nonirrigated land capability: 7s
 Ecological site: F028AY084NV

Component Description

Pirapeak and similar soils

Landform: Backslopes of mountains

Slope: 30 to 75 percent, east to northwest aspects

Parent material: Colluvium derived from granite (Fig. 22)



Figure 22—The Pirapeak soil formed in colluvium derived from granitic rocks. A high volume of stones, boulders, and cobbles covers the soil surface.

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—mountain brome, Ross' sedge, slender wheatgrass, skyline bluegrass, needlegrass, other perennial grasses, other perennial forbs, common juniper, gooseberry currant, Engelmann's spruce, limber pine, quaking aspen, other trees, muttongrass

Site index: Engelmann's spruce—30 at an age base of 100 years

Typical profile:

Surface rock fragments: About 20 percent angular boulders, 20 percent angular stones, 20 percent angular cobbles, 20 percent angular gravel

Layer 1—0 to 1 inch; slightly decomposed plant material

Layer 2—1 to 6 inches; extremely bouldery coarse sandy loam

Layer 3—6 to 17 inches; very cobbly coarse sandy loam

Layer 4—17 to 61 inches; extremely cobbly loamy coarse sand

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Somewhat excessively drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: F028AY083NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Snacreek and similar soils

Composition: 0 to 5 percent

Slope: 8 to 50 percent, east to northwest aspects

Landform: Backslopes of lower elevation mountains

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—quaking aspen, Engelmann's spruce, mountain snowberry, other shrubs, willow, Utah serviceberry, other perennial forbs, Nevada bluegrass, skyline bluegrass, other trees, slender wheatgrass, mountain brome, Oregongrape, white fir

Ecological site: F028AY078NV

Rock outcrop

Composition: 0 to 5 percent

Slope: 30 to 75 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Ecological site: None

5410—Timmercreek very gravelly highly organic loam, 15 to 50 percent slopes*Map Unit Setting*

MLRA: 28A

Landscape: Mountains

Elevation: 9,480 to 11,300

Precipitation: 24 to 37 inches

Air temperature: 35 to 39 degrees Fahrenheit

Frost-free period: 30 to 50 days

Composition

Timmercreek very gravelly highly organic loam, 15 to 50 percent slopes—85 percent

Wheelerpek extremely gravelly loam, 30 to 75 percent slopes—6 percent

Timmercreek family very gravelly loam, 30 to 75 percent slopes—5 percent

Brokit very stony highly organic loam, 8 to 30 percent slopes—2 percent

Jumble extremely stony loam, 15 to 50 percent slopes—2 percent

Component Description

Timmercreek and similar soils

Landform: Backslopes of higher elevation ground moraines

Slope: 15 to 50 percent, northwest to east aspects

Parent material: Till derived from quartzite, shale and argillite

Typical vegetation: Forest canopy—Engelmann's spruce, quaking aspen

Forest understory—Oregon grape, other perennial forbs, Nevada bluegrass, skyline bluegrass, mountain snowberry, white fir, Engelmann's spruce, quaking aspen, other trees, slender wheatgrass, mountain brome, willow, Utah serviceberry, other shrubs
Site index: Engelmann's spruce—65 at an age base of 100 years
Site index: Quaking aspen—45 at an age base of 50 years

Typical profile:

Surface rock fragments: About 3 percent subrounded stones, 25 percent subrounded gravel, 10 percent subrounded cobbles
Layer 1—0 to 1 inch; slightly decomposed plant material
Layer 2—1 to 13 inches; very gravelly highly organic loam
Layer 3—13 to 35 inches; extremely gravelly sandy loam
Layer 4—35 to 60 inches; extremely gravelly sandy loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY078NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Wheelerpek and similar soils

Composition: 0 to 6 percent

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains; Summits of mountains; Shoulders of mountains

Typical vegetation: Dunhead sedge, Wheeler bluegrass, Ross' sedge, slender wheatgrass, muttongrass, other perennial grasses, timberline bluegrass, other perennial forbs, other shrubs, wax currant

Ecological site: R028AY071NV—Alpine Slope

Timmercreek family and similar soils

Composition: 0 to 5 percent

Classification: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Slope: 30 to 75 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—quaking aspen

Forest understory—nodding brome, other perennial forbs, other perennial grasses, other shrubs, mountain snowberry, slender wheatgrass, quaking aspen, mountain big sagebrush, mountain brome

Ecological site: R028AY073NV—Aspen Thicket

Brokit and similar soils

Composition: 0 to 2 percent

Slope: 8 to 30 percent, all aspects

Landform: Stream terraces

Typical vegetation: Forest canopy—quaking aspen

Forest understory—Nevada bluegrass, other perennial grasses, other perennial forbs, willow, other shrubs, mountain snowberry, white fir, quaking aspen, skyline bluegrass, other trees, rush, sedge, slender wheatgrass
Ecological site: F028AY056NV

Jumble and similar soils

Composition: 0 to 2 percent

Slope: 15 to 50 percent, northwest to east aspects

Landform: Backslopes of higher elevation moraines

Typical vegetation: Forest canopy—Engelmann's spruce

Forest understory—limber pine, gooseberry currant, common juniper, other perennial forbs, other perennial grasses, muttongrass, other trees, quaking aspen, skyline bluegrass, slender wheatgrass, Ross' sedge, mountain brome, needlegrass, Engelmann's spruce
Ecological site: F028AY083NV

5420—Topeki-Badhap-Jonlake association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 6,820 to 10,000

Precipitation: 16 to 28 inches

Air temperature: 37 to 43 degrees Fahrenheit

Frost-free period: 30 to 60 days

Composition

Topeki extremely gravelly loam, 15 to 50 percent slopes—35 percent

Badhap very stony loam, 15 to 50 percent slopes—35 percent

Jonlake extremely gravelly loam, 8 to 30 percent slopes—15 percent

Hardol very gravelly silt loam, 15 to 50 percent slopes—5 percent

Badhap very gravelly loam, 15 to 50 percent slopes—4 percent

Osditch extremely stony loam, 15 to 50 percent slopes—3 percent

Rock outcrop, 15 to 50 percent slopes—2 percent

Ripcon gravelly loam, 2 to 15 percent slopes—1 percent

Component Description

Topeki and similar soils

Landform: Summits of mountains; Shoulders of mountains

Slope: 15 to 50 percent, east to northwest aspects

Parent material: Colluvium and residuum derived from quartzite

Typical vegetation: Curlleaf mountainmahogany, mountain big sagebrush, Letterman needlegrass, other perennial forbs, bluebunch wheatgrass (Fig. 23)

Typical profile:

Surface rock fragments: About 3 percent subangular boulders, 20 percent subangular gravel, 20 percent subangular stones, 20 percent subangular cobbles

Layer 1—0 to 12 inches; extremely gravelly loam

Layer 2—12 to 15 inches; extremely stony loam

Layer 3—15 to 25 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.



Figure 23—A view of map unit 5420. Curlleaf mountainmahogany vegetation is indicative of the Topeki soils.

Component Properties and Qualities

Runoff: Very high

Depth to restrictive feature: Lithic bedrock: 10 to 20 inches

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 1.2 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: R028AY058NV—Stony Mahogany Savanna

Component Description

Badhap and similar soils

Landform: Backslopes of mountains

Slope: 15 to 50 percent, all aspects

Parent material: Colluvium and residuum derived from quartzite

Typical vegetation: Muttongrass, other perennial grasses, mountain big sagebrush, other perennial forbs, bluebunch wheatgrass, other shrubs, mountain snowberry

Typical profile:

Layer 1—0 to 3 inches; very stony loam

Layer 2—3 to 44 inches; extremely cobbly loam
Layer 3—44 to 60 inches; extremely cobbly loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high
Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)
Available water capacity: About 5 inches
Present flooding: None
Present ponding: None
Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s
Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Component Description

Jonlake and similar soils
Landform: Summits of mountains; Shoulders of mountains
Slope: 8 to 30 percent, all aspects
Parent material: Colluvium and residuum derived from quartzite with local mixtures of argillite
Typical vegetation: Low sagebrush, other perennial grasses, needlegrass, muttongrass, other shrubs, other perennial forbs, bluebunch wheatgrass

Typical profile:

Surface rock fragments: About 40 percent angular gravel, 2 percent angular stones, 20 percent angular cobbles
Layer 1—0 to 14 inches; extremely gravelly loam
Layer 2—14 to 17 inches; extremely gravelly loam
Layer 3—17 to 21 inches; bedrock

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: High
Depth to restrictive feature: Lithic bedrock: 12 to 20 inches
Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)
Available water capacity: About 1.5 inches
Present flooding: None
Present ponding: None
Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s
Ecological site: R028AY061NV—Claypan 14+ P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Hardol and similar soils
Composition: 0 to 5 percent
Slope: 15 to 50 percent, all aspects
Landform: Backslopes of mountains
Typical vegetation: Other shrubs, other trees, curlleaf mountainmahogany, other perennial forbs, mountain snowberry, needlegrass, other perennial grasses

Ecological site: R028AY060NV—Mahogany Thicket

Badhap and similar soils

Composition: 0 to 4 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Other perennial grasses, nodding brome, needlegrass, other perennial forbs, mountain big sagebrush, other shrubs, mountain snowberry, slender wheatgrass, mountain brome

Ecological site: R028AY057NV—Loamy 16+ P.Z.

Osditch and similar soils

Composition: 0 to 3 percent

Slope: 15 to 50 percent, northwest to east aspects

Landform: Backslopes of higher elevation mountains

Typical vegetation: Forest canopy—Douglas fir, white fir

Forest understory—mutton forbs, common juniper, Oregon grape, other shrubs, mountain snowberry, quaking aspen, Rocky Mountain Douglas fir, other trees, white fir, sedge

Ecological site: F028AY080NV

Rock outcrop

Composition: 0 to 2 percent

Slope: 15 to 50 percent, all aspects

Landform: Shoulders of mountains; Summits of mountains

Ecological site: None

Ripcon and similar soils

Composition: 0 to 1 percent

Slope: 2 to 15 percent, all aspects

Landform: Drainageways

Typical vegetation: Forest canopy—narrowleaf cottonwood

Forest understory—narrowleaf cottonwood, sedge, slender wheatgrass, rush, basin wildrye, skunkbush sumac, willow, other shrubs, water birch, bluegrass, other perennial forbs, other perennial grasses

Ecological site: F028AY079NV

5425—Ripcon-Bigwash-Glideski association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 6,200 to 7,250

Precipitation: 12 to 20 inches

Air temperature: 39 to 45 degrees Fahrenheit

Frost-free period: 40 to 100 days

Composition

Ripcon gravelly loam, 2 to 8 percent slopes—40 percent

Bigwash loam, 4 to 8 percent slopes—30 percent

Glideski gravelly loam, 4 to 15 percent slopes—15 percent

Ravendog loam, 2 to 8 percent slopes—5 percent

Devilsgait silt loam, 0 to 2 percent slopes—3 percent

Lehmandow loam, 0 to 4 percent slopes—3 percent

Washover very gravelly loam, 2 to 15 percent slopes—2 percent

Canyonfork very gravelly fine sandy loam, 4 to 15 percent slopes—1 percent

Chainlink gravelly loam, 4 to 8 percent slopes—1 percent

Component Description

Ripcon and similar soils

Landform: Drainageways

Slope: 2 to 8 percent, all aspects

Parent material: Alluvium derived from limestone, dolomite, quartzite, and granite

Typical vegetation: Forest canopy—narrowleaf cottonwood

Forest understory—other perennial forbs, skunkbush sumac, willow, other shrubs, other perennial grasses, narrowleaf cottonwood, bluegrass, basin wildrye, rush, slender wheatgrass, sedge, water birch

Site index: Narrowleaf cottonwood—86

Typical profile:

Surface rock fragments: About 5 percent rounded gravel

Layer 1—0 to 5 inches; gravelly loam

Layer 2—5 to 15 inches; very gravelly loam

Layer 3—15 to 62 inches; extremely gravelly sandy loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: Occasional

Present ponding: None

Water table: Present

Natural drainage class: Moderately well drained

Interpretive Groups

Nonirrigated land capability: 7w

Ecological site: F028AY079NV

Component Description

Bigwash and similar soils

Landform: Drainageways

Slope: 4 to 8 percent, all aspects

Parent material: Alluvium derived from limestone and minor amounts of quartzite

Typical vegetation: Other shrubs, basin wildrye, slender wheatgrass, mountain big sagebrush, other perennial forbs, Nevada bluegrass

Typical profile:

Surface rock fragments: About 5 percent subrounded gravel

Layer 1—0 to 9 inches; loam

Layer 2—9 to 60 inches; loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 9 inches

Present flooding: Rare

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 6w

Ecological site: R028AY055NV—Loamy Bottom 14+ P.Z.

Component Description

Glideski and similar soils

Landform: Stream terraces

Slope: 4 to 15 percent, all aspects

Parent material: Alluvium and outwash derived from quartzite, granite, and limestone.

Typical vegetation: Antelope bitterbrush, needlegrass, basin wildrye, muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, other shrubs

Typical profile:

Surface rock fragments: About 20 percent rounded gravel, 2 percent rounded boulders, 10 percent rounded stones, 15 percent rounded cobbles

Layer 1—0 to 4 inches; gravelly loam

Layer 2—4 to 14 inches; very cobbly loam

Layer 3—14 to 39 inches; extremely cobbly loam

Layer 4—39 to 60 inches; extremely stony loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY092NV—Loamy 12-14 P.Z.

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Ravendog and similar soils

Composition: 0 to 5 percent

Slope: 2 to 8 percent, all aspects

Landform: Inset fans

Typical vegetation: Other shrubs, other perennial forbs, basin big sagebrush, thickspike wheatgrass, needleandthread, basin wildrye, other perennial grasses

Ecological site: R028AY091NV—Loamy Fan 10-14 P.Z.

Devilsgait and similar soils

Composition: 0 to 3 percent

Slope: 0 to 2 percent, all aspects

Landform: Flood plains

Typical vegetation: Forest canopy—narrowleaf cottonwood

Forest understory—bluegrass, other perennial grasses, other perennial forbs, skunkbush sumac, willow, other shrubs, basin wildrye, rush, water birch, narrowleaf cottonwood, sedge, slender wheatgrass

Ecological site: F028AY079NV

Lehmandow and similar soils

Composition: 0 to 3 percent

Slope: 0 to 4 percent, all aspects

Landform: Stream terraces

Typical vegetation: Sedge, alpine timothy, Nevada bluegrass, tufted hairgrass, other perennial forbs, other perennial grasses, other shrubs, Shrubby cinquefoil

Ecological site: R028AY072NV—Wet Meadow

Washover and similar soils

Composition: 0 to 2 percent

Slope: 2 to 15 percent, all aspects

Landform: Backslopes of young alluvial fans

Typical vegetation: Muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, mountain big sagebrush, wild crab apple, Stansbury cliffrose, other shrubs, Indian ricegrass

Ecological site: R028AY127NV—Loamy Fan Piedmont

Canyonfork and similar soils

Composition: 0 to 1 percent

Slope: 4 to 15 percent, all aspects

Landform: Young alluvial fans

Typical vegetation: Needleandthread, other perennial forbs, Indian ricegrass, bluebunch wheatgrass, other perennial forbs, black sagebrush, wild crab apple, Stansbury cliffrose, other shrubs

Ecological site: R028AY087NV—Calcareous Fan Piedmont 10-14 P.Z.

Chainlink and similar soils

Composition: 0 to 1 percent

Slope: 4 to 8 percent, all aspects

Landform: Fan remnants

Typical vegetation: Muttongrass, needleandthread, bluebunch wheatgrass, Stansbury cliffrose, other shrubs, other perennial forbs, Indian ricegrass, black sagebrush

Ecological site: R028AY043NV—Shallow Calcareous Loam 10-14 P.Z.

5428—Rippo-Lehmandow-Brokit association*Map Unit Setting*

MLRA: 28A

Landscape: Mountains

Elevation: 7,090 to 9,020

Precipitation: 16 to 28 inches

Air temperature: 37 to 43 degrees Fahrenheit

Frost-free period: 40 to 70 days

Note: This map unit is designed to identify unique soils along streams and drainageways. They are narrow linear features that are identified on the soil maps by labeled line segments rather than by traditional soil polygons.

Composition

Rippo very cobbly loam, 4 to 15 percent slopes—45 percent

Lehmandow loam, 2 to 8 percent slopes—25 percent

Brokit very stony highly organic loam, 4 to 15 percent slopes—15 percent

Devilsgait silt loam, 0 to 2 percent slopes—7 percent

Steptoe gravelly loam, 4 to 15 percent slopes—5 percent

Ripcon gravelly loam, 2 to 15 percent slopes—3 percent



Figure 24—The Rippon series occurs along drainageways in mountain valleys.

Component Description

Rippon and similar soils

Landform: Drainageways (Fig. 24)

Slope: 4 to 15 percent, all aspects

Parent material: Alluvium derived from limestone, dolomite, quartzite and granite

Typical vegetation: Forest canopy—Ponderosa pine

Forest understory—Woods' rose, Booth's willow, other shrubs, water birch, Ponderosa pine, other trees, Baltic rush, beardless wildrye, Kentucky bluegrass, other perennial grasses, other perennial forbs

Site index: Ponderosa pine—75

Typical profile:

Surface rock fragments: About 10 percent rounded stones, 5 percent rounded gravel, 5 percent rounded cobbles

Layer 1—0 to 6 inches; moderately decomposed plant material

Layer 2—6 to 12 inches; very cobbly loam

Layer 3—12 to 60 inches; extremely stony sandy loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Low

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately Rapid)

Available water capacity: About 7 inches

Present flooding: Occasional

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY128NV

Component Description

Lehmandow and similar soils

Landform: Stream terraces

Slope: 2 to 8 percent, all aspects

Parent material: Alluvium derived from quartzite, limestone, and granite over till derived from quartzite, limestone and granite

Typical vegetation: Shrubby cinquefoil, other perennial forbs, sedge, other shrubs, other perennial grasses, Nevada bluegrass, alpine timothy, tufted hairgrass

Typical profile:

Layer 1—0 to 10 inches; loam

Layer 2—10 to 60 inches; very stony clay loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Very high

Saturated hydraulic conductivity class (root zone): Low, (Permeability class: Very slow)

Available water capacity: About 8 inches

Present flooding: Occasional

Present ponding: None

Water table: Present

Natural drainage class: Poorly drained

Interpretive Groups

Nonirrigated land capability: 6w

Ecological site: R028AY072NV—Wet Meadow

Component Description

Brokit and similar soils

Landform: Ground moraines

Slope: 4 to 15 percent, all aspects

Parent material: Alluvium and outwash derived from quartzite and minor amounts of granite, limestone

Typical vegetation: Forest canopy—quaking aspen

Forest understory—rush, other trees, white fir, quaking aspen, sedge, slender wheatgrass, skyline bluegrass, Nevada bluegrass, other perennial grasses, other perennial forbs, willow, other shrubs, mountain snowberry

Site index: Quaking aspen—70 at an age base of 50 years

Typical profile:

Surface rock fragments: About 35 percent rounded gravel, 5 percent rounded stones, 5 percent rounded cobbles

Layer 1—0 to 16 inches; very stony highly organic loam

Layer 2—16 to 60 inches; extremely cobbly loamy coarse sand

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches

Present flooding: Occasional

Present ponding: None
 Water table: Present
 Natural drainage class: Somewhat poorly drained

Interpretive Groups

Nonirrigated land capability: 7s
 Ecological site: F028AY056NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Devilsgait and similar soils
 Composition: 0 to 7 percent
 Slope: 0 to 2 percent, all aspects
 Landform: Flood plains
 Typical vegetation: Forest canopy—narrowleaf cottonwood
 Forest understory—other shrubs, narrowleaf cottonwood, willow, water birch, sedge, slender wheatgrass, rush, basin wildrye, bluegrass, other perennial grasses, other perennial forbs, skunkbush sumac
 Ecological site: F028AY079NV

Steptoe and similar soils
 Composition: 0 to 5 percent
 Slope: 4 to 15 percent, all aspects
 Landform: Stream terraces
 Typical vegetation: Willow, Nevada bluegrass, Woods' rose, western chokecherry, other perennial forbs, other perennial grasses, sedge, tufted hairgrass
 Ecological site: R028BY103NV—Stream Type B

Ripcon and similar soils
 Composition: 0 to 3 percent
 Slope: 2 to 15 percent, all aspects
 Landform: Drainageways
 Typical vegetation: Forest canopy—narrowleaf cottonwood
 Forest understory—other perennial forbs, rush, slender wheatgrass, skunkbush sumac, willow, other shrubs, sedge, basin wildrye, bluegrass, other perennial grasses, narrowleaf cottonwood, water birch
 Ecological site: F028AY079NV

5430—Brokit very stony highly organic loam, 8 to 15 percent slopes

Map Unit Setting

MLRA: 28A
 Landscape: Mountains
 Elevation: 7,090 to 8,820
 Precipitation: 18 to 28 inches
 Air temperature: 37 to 43 degrees Fahrenheit
 Frost-free period: 40 to 60 days

Composition

Brokit very stony highly organic loam, 8 to 15 percent slopes—85 percent
 Brokit very stony highly organic loam, 4 to 8 percent slopes—5 percent
 Lehmandow loam, 4 to 8 percent slopes—5 percent
 Glideski gravelly loam, 8 to 15 percent slopes—5 percent

Component Description

Brokit and similar soils

Landform: Ground moraines

Slope: 8 to 15 percent, all aspects

Parent material: Alluvium and outwash derived from quartzite and minor amounts of granite, limestone

Typical vegetation: Forest canopy—quaking aspen

Forest understory—other trees, white fir, mountain snowberry, other shrubs, willow, quaking aspen, other perennial grasses, Nevada bluegrass, other perennial forbs, skyline bluegrass, sedge, slender wheatgrass, rush

Site index: Quaking aspen—70 at an age base of 50 years

Typical profile:

Surface rock fragments: About 5 percent rounded cobbles, 35 percent rounded gravel, 5 percent rounded stones

Layer 1—0 to 16 inches; very stony highly organic loam

Layer 2—16 to 60 inches; extremely cobbly loamy coarse sand

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches

Present flooding: Occasional

Present ponding: None

Water table: Present

Natural drainage class: Somewhat poorly drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: F028AY056NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Brokit and similar soils

Composition: 0 to 5 percent

Slope: 4 to 8 percent, all aspects

Landform: Stream terraces

Typical vegetation: Forest canopy—quaking aspen

Forest understory—willow, other perennial grasses, sedge, rush, other shrubs, mountain snowberry, white fir, quaking aspen, other trees, slender wheatgrass, other perennial forbs, Nevada bluegrass, skyline bluegrass

Ecological site: F028AY056NV

Lehmandow and similar soils

Composition: 0 to 5 percent

Slope: 4 to 8 percent, all aspects

Landform: Stream terraces

Typical vegetation: Alpine timothy, sedge, tufted hairgrass, Nevada bluegrass, other perennial grasses, other perennial forbs, other shrubs, Shrubby cinquefoil

Ecological site: R028AY072NV—Wet Meadow

Glideski and similar soils

Composition: 0 to 5 percent

Slope: 8 to 15 percent, all aspects

Landform: Stream terraces

Typical vegetation: Antelope bitterbrush, other shrubs, needlegrass, basin wildrye, muttongrass, other perennial grasses, bluebunch wheatgrass, other perennial forbs, mountain big sagebrush

Ecological site: R028AY092NV—Loamy 12-14 P.Z.

5432—Glideski-Brokit-Lemcave association

Map Unit Setting

MLRA: 28A

Landscape: Mountains

Elevation: 6,820 to 9,190

Precipitation: 16 to 28 inches

Air temperature: 37 to 43 degrees Fahrenheit

Frost-free period: 40 to 70 days

Composition

Glideski gravelly loam, 4 to 15 percent slopes—35 percent

Brokit very stony highly organic loam, 4 to 15 percent slopes—30 percent

Lemcave extremely gravelly sandy loam, 15 to 50 percent slopes—20 percent

Lehmandow loam, 0 to 4 percent slopes—5 percent

Rock outcrop, 15 to 50 percent slopes—4 percent

Cropper family gravelly loam, 15 to 50 percent slopes—3 percent

Goodski very gravelly loam, 4 to 15 percent slopes—2 percent

Ripcon gravelly loam, 2 to 15 percent slopes—1 percent



Figure 25—Glideski soils with mountain big sagebrush and snowberry vegetation (foreground) formed in alluvium and outwash material. Aspen vegetation in the background is on Brokit soil.

Component Description

Glideski and similar soils

Landform: Stream terraces

Slope: 4 to 15 percent, all aspects

Parent material: Alluvium and Outwash derived from quartzite, granite, and limestone.

Typical vegetation: Needlegrass, basin wildrye, muttongrass, other perennial grasses, bluebunch wheatgrass, mountain big sagebrush, antelope bitterbrush, other perennial forbs, other shrubs (Fig. 25)

Typical profile:

Surface rock fragments: About 2 percent rounded boulders, 10 percent rounded stones, 15 percent rounded cobbles, 20 percent rounded gravel

Layer 1—0 to 4 inches; gravelly loam

Layer 2—4 to 14 inches; very cobbly loam

Layer 3—14 to 39 inches; extremely cobbly loam

Layer 4—39 to 60 inches; extremely stony loam

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 4 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 7s

Ecological site: R028AY092NV—Loamy 12-14 P.Z.

Component Description

Brokit and similar soils

Landform: Stream terraces

Slope: 4 to 15 percent, all aspects

Parent material: Alluvium and outwash derived from quartzite and minor amounts of granite, limestone

Typical vegetation: Forest canopy—quaking aspen (Fig. 26)

Forest understory—sedge, willow, quaking aspen, other trees, other shrubs, white fir, mountain snowberry, slender wheatgrass, rush, skyline bluegrass, Nevada bluegrass, other perennial grasses, other perennial forbs

Site index: Quaking aspen—70 at an age base of 50 years

Typical profile:

Surface rock fragments: About 5 percent rounded cobbles, 5 percent rounded stones, 35 percent rounded gravel

Layer 1—0 to 16 inches; very stony highly organic loam

Layer 2—16 to 60 inches; extremely cobbly loamy coarse sand

See “Chemical Soil Properties” table and the “Physical Soil Properties” table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): Moderately High, (Permeability class: Moderate)

Available water capacity: About 3 inches



Figure 26—Regrowth of characteristic aspen vegetation occurring on the Brokit soil.

Present flooding: Occasional
 Present ponding: None
 Water table: Present
 Natural drainage class: Somewhat poorly drained

Interpretive Groups

Nonirrigated land capability: 7s
 Ecological site: F028AY056NV

Component Description

Lemcave and similar soils
 Landform: Backslopes of lower elevation moraines
 Slope: 15 to 50 percent, northwest to east aspects
 Parent material: Till and outwash derived dominantly from quartzite and small amounts of granite
 Typical vegetation: Forest canopy—Douglas fir, white fir
 Forest understory—Rocky Mountain Douglas fir, quaking aspen, white fir, mountain snowberry, other shrubs, Oregon grape, common juniper, other perennial forbs, other perennial grasses, muttongrass, skyline bluegrass, sedge, other trees
 Site index: Douglas fir—40 at an age base of 50 years
 Site index: White fir—42 at an age base of 50 years

Typical profile:

Surface rock fragments: About 10 percent subrounded stones, 15 percent subrounded cobbles, 25 percent subrounded gravel, 5 percent subrounded boulders
 Layer 1—0 to 1 inch; slightly decomposed plant material
 Layer 2—1 to 8 inches; extremely gravelly sandy loam
 Layer 3—8 to 30 inches; extremely cobbly loamy coarse sand
 Layer 4—30 to 61 inches; extremely cobbly loamy coarse sand

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Medium

Saturated hydraulic conductivity class (root zone): High, (Permeability class: Moderately rapid)

Available water capacity: About 3 inches

Present flooding: None

Present ponding: None

Natural drainage class: Well drained

Interpretive Groups

Nonirrigated land capability: 8s

Ecological site: F028AY080NV

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Lehmandow and similar soils

Composition: 0 to 5 percent

Slope: 0 to 4 percent, all aspects

Landform: Stream terraces

Typical vegetation: Alpine timothy, tufted hairgrass, sedge, Nevada bluegrass, other perennial grasses, other perennial forbs, other shrubs, Shrubby cinquefoil

Ecological site: R028AY072NV—Wet Meadow

Rock outcrop

Composition: 0 to 4 percent

Slope: 15 to 50 percent, all aspects

Landform: Backslopes of mountains

Ecological site: None

Cropper family and similar soils

Composition: 0 to 3 percent

Slope: 15 to 50 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Curlleaf mountainmahogany, mountain big sagebrush, other perennial forbs, other perennial grasses, muttongrass, needlegrass, bluebunch wheatgrass

Ecological site: R028AY059NV—Mahogany Savanna

Goodski and similar soils

Composition: 0 to 2 percent

Slope: 4 to 15 percent, all aspects

Landform: Backslopes of mountains

Typical vegetation: Other perennial grasses, mountain big sagebrush, bluebunch wheatgrass, other shrubs, mountain snowberry, other perennial forbs, muttongrass

Ecological site: R028AY065NV—Shallow Loam 14+ P.Z.

Ripcon and similar soils

Composition: 0 to 1 percent

Slope: 2 to 15 percent, all aspects

Landform: Drainageways

Typical vegetation: Forest canopy—narrowleaf cottonwood

Forest understory—other perennial grasses, other perennial forbs, skunkbush sumac, willow, slender wheatgrass, bluegrass, other shrubs, basin wildrye, rush, narrowleaf cottonwood, sedge, water birch

Ecological site: F028AY079NV

5434—Lehmandow loam, 2 to 8 percent slopes*Map Unit Setting*

MLRA: 28A

Landscape: Mountains

Elevation: 7,380 to 9,020

Precipitation: 16 to 20 inches

Air temperature: 39 to 43 degrees Fahrenheit

Frost-free period: 40 to 60 days

Composition

Lehmandow loam, 2 to 8 percent slopes—90 percent

Glideski gravelly loam, 4 to 15 percent slopes—6 percent

Closkey very gravelly loamy coarse sand, 4 to 30 percent slopes—3 percent

Garnel very gravelly coarse sandy loam, 15 to 30 percent slopes—1 percent

Component Description

Lehmandow and similar soils (Fig. 27)

Landform: Stream terraces

Slope: 2 to 8 percent, all aspects

Parent material: Alluvium derived from quartzite, limestone, and granite over till derived from quartzite, limestone and granite

Typical vegetation: Sedge, tufted hairgrass, alpine timothy, Nevada bluegrass, other perennial grasses, other perennial forbs, other shrubs, Shrubby cinquefoil



Figure 27—The Lehmandow soils are characteristically wet during most of the year due to high water tables.

Typical profile:

Layer 1—0 to 10 inches; loam

Layer 2—10 to 60 inches; very stony clay loam

See "Chemical Soil Properties" table and the "Physical Soil Properties" table for more information.

Component Properties and Qualities

Runoff: Very high

Saturated hydraulic conductivity class (root zone): Low, (Permeability class: Very slow)

Available water capacity: About 8 inches

Present flooding: Occasional

Present ponding: None

Water table: Present

Natural drainage class: Poorly drained

Interpretive Groups

Nonirrigated land capability: 6w

Ecological site: R028AY072NV—Wet Meadow

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Glideski and similar soils

Composition: 0 to 6 percent

Slope: 4 to 15 percent, all aspects

Landform: Stream terraces

Typical vegetation: Bluebunch wheatgrass, antelope bitterbrush, needlegrass, basin wildrye, muttongrass, other perennial grasses, other perennial forbs, mountain big sagebrush, other shrubs

Ecological site: R028AY092NV—Loamy 12-14 P.Z.

Closkey and similar soils

Composition: 0 to 3 percent

Slope: 4 to 30 percent, east to northwest aspects

Landform: Fan remnants

Typical vegetation: Bluebunch wheatgrass, bluegrass, mountain big sagebrush, Thurber needlegrass, other perennial grasses, other perennial forbs, antelope bitterbrush, other shrubs

Ecological site: R028AY066NV—Gravelly Loam 12-14 P.Z.

Garnel and similar soils

Composition: 0 to 1 percent

Slope: 15 to 30 percent, east to northwest aspects

Landform: Backslopes of mountains

Typical vegetation: Forest canopy—Utah juniper, singleleaf pinyon

Forest understory—other perennial grasses, antelope bitterbrush, curlleaf mountainmahogany, bluebunch wheatgrass, other perennial forbs, muttongrass, basin wildrye, Utah serviceberry, mountain big sagebrush, other shrubs, snowberry

Ecological site: F028AY076NV

5440—Glaciers*Map Unit Setting*

MLRA: 28A

Landscape: Mountains

Elevation: 10,700 to 11,600

Precipitation: 24 to 37 inches

Air temperature: 35 to 39 degrees Fahrenheit
Frost-free period: 30 to 50 days

Composition

Glaciers, 15 to 75 percent slopes—85 percent
Wheelerpek extremely gravelly loam, 8 to 50 percent slopes—9 percent
Rubble land, 15 to 50 percent slopes—6 percent

Component Description

Glaciers
Landform: Glaciers
Slope: 15 to 75 percent, northwest to east aspects

Component Properties and Qualities

Present ponding: None

Interpretive Groups

Nonirrigated land capability: 8s
Ecological site: None

Typical soil descriptions including ranges in characteristics are in the "Classification of the Soils" section.

Contrasting Inclusions

Wheelerpek and similar soils
Composition: 0 to 9 percent
Slope: 8 to 50 percent, all aspects
Landform: Backslopes of mountains; Shoulders of mountains
Typical vegetation: Alpine fescue, dunhead sedge, Ross' sedge, Engelmann's spruce, bluegrass,
Wheeler bluegrass, other perennial forbs
Ecological site: R028AY069NV—Alpine Ridge

Rubble land
Composition: 0 to 6 percent
Slope: 15 to 50 percent, all aspects
Landform: Backslopes of mountains
Ecological site: None

Use and Management

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; for agricultural waste management; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes. In the capability system, soils are generally grouped at three levels-- capability class, subclass, and unit (USDA, 1961).

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 - Slight limitations that restrict their use.

Class 2 - Moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 - Severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 - Very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 - Subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 - Severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 - Very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 - Miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2*e*. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2*e*-4 and 3*e*-6. These units are not given in all soil surveys.

The capability classification of the soils in this survey area is given in the section "Detailed Soil Map Units" and in table 5, "Land Capability Classification".

Rangeland and Forestland Resource Management

Clint Anderson and Patti Novak-Echenique, Rangeland Management Specialists, Natural Resource Conservation Service, helped prepare this section.

Rangeland, within this report, is considered a "kind of land" rather than a particular kind of land use. Rangeland provides many important resource values, acting as vast watersheds, providing habitat for wildlife, offering forage for wildlife and livestock, and space and beauty for recreational pursuits. The resource values of rangeland are intricately related to each other and are often directly affected by rangeland management actions. Because of the interrelation between rangeland resources, it is appropriate that rangeland managers consider all resource values when planning range improvements.

About 98 percent of the land in the survey area is rangeland and forestland. Other lands include water, glaciers and impermeable areas such as buildings and roads. All of the rangeland within the survey area is administered by the National Park Service.

Mining has played an important role in the history of this area. During the mining booms of the late 1800's and early 1900's, herds of cattle, sheep, oxen, horses, and burros, were brought to White Pine County to power and feed the mining communities. Heavy grazing pressure during these boom-periods depleted native stands of forage over much of the survey area.

The early devastation of rangeland plant communities through uncontrolled livestock grazing has long ended. However, severely depleted areas still reflect the impacts of early abusive grazing and other disturbances associated with early settlement. Where disturbance has been most severe, palatable shrubs have generally been replaced by less desirable shrubs and many native perennial grasses and forbs have been eliminated and replaced by alien or introduced annual grasses and forbs. Recovery has been most evident where previous abuses were limited or at higher elevations with greater precipitation. It is axiomatic that the greater the level of deterioration, the longer the period of recovery is for native plant communities. Also the drier the community the less resilient it is to disturbance. Those communities receiving less than about 10 inches of average annual precipitation are very slow to recover and may never recover on their own without mechanical inputs. It is important to recognize that although present day rangeland production and plant diversity in the survey area is generally less than what is potentially achievable, the overall health or condition of rangeland in the survey area today is improved from what was commonplace in the early 1900's.

Soil-Site Correlation

Landscapes are divided into basic units for study, evaluation, and management. On rangeland and forestland, these units are called ecological sites. During the course of this soil survey, range and forest ecological sites were correlated to soils identified within the survey area. These correlations are based on our present understanding of soil-plant-climate relationships in the survey area. Soil properties, such as rooting depth and texture, that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt or calcium carbonate content, and topographic position are also important. Climatic relationships to vegetation and soils are accounted for in the classification of soils and in soil mapping criteria. In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the type of soil. Dominant ecological sites can be determined from soil maps and map unit legends developed for the survey area.

An ecological site is a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. An ecological site

is the product of all environmental factors responsible for its development. It can support a native plant community typified by an association of species that differs from the potential plant community of other ecological sites in the kind or proportion of species or in total production. Disturbances such as drought, fire, grazing by native fauna, or insect and disease damage are recognized as natural factors in the development of native plant communities.

Table 7, "Ecological Site-Soil Correlation", lists the ecological sites correlated too each soil component for the map units of the soil survey. The ecological site name, the ecological site type, and the ecological site id are given for each soil component. Rangeland ecological sites and forestland ecological sites reflect differences in site naming convention. Rangeland ecological site names ordinarily are based on characteristic landform, soil and precipitation features. Forestland ecological sites are named by listing the dominant plant species.

Table 8, "Landscape, Parent Material, and Ecological Site", shows each soil component and correlated ecological site and number along with important climatic and topographic features that are important in understanding some of the factors that impact soil-ecological site correlations. These features include the slope and elevation of the soil component. The characteristic landscape of the map unit is listed in the first component of each map unit. The landscape is a broad feature that describes the setting of the entire map unit as a whole. To avoid redundancy, the landscape is not listed for subsequent components in the map unit. Landform, which is usually applicable to individual soils, is listed for each soil component. Soil parent material is also given for each soil component. Minor components, (components that are less than 15 percent of the map unit), usually do not contain estimates of elevation and precipitation.

Ecological Site Descriptions

Table 6, "Ecological Sites and Characteristic Plant Communities", shows each soil and contrasting inclusion, while including the ecological site; the common plant name and scientific plant symbol for the characteristic vegetation; the average percent composition for each species in the potential plant community; and the total annual production of vegetation in favorable, normal, and unfavorable years. The characteristic vegetation, made up of the grasses, forbs, shrubs and trees of the potential plant community for each soil, are listed by common name. Under composition, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount of vegetation that can be used as forage depends on the kinds of grazing animals, the grazing season, and availability of forage.

Total production is the amount of vegetation that can be expected to grow annually on well-managed rangeland that is supporting the potential natural community. Total production includes all vegetation, whether or not it is palatable to grazing animals. It does not include the increase in stem diameter of trees and shrubs. The total production of understory vegetation includes the herbaceous plants and the leaves, twigs, and fruit of woody plants up to a height of 4.5 feet. It is expressed in pounds per acre of air-dry vegetation in favorable, normal, and unfavorable years. In a favorable year, soil moisture is above average during the optimum part of the growing season; in a normal year, soil moisture is average; and in an unfavorable year, it is below average.

Also included in each table is the ecological site number. A more detailed description of each site, identified by number, can be found at the local NRCS Service Center.

Forty-four distinct ecological sites have currently been identified within the Great Basin National Park by soil survey crews. In the following brief descriptions, the primary characteristics of each site are summarized. Soil, hydrology and climatic characteristics may be described in addition to the vegetative characteristics where they are important features in the site. If photographs were obtained, they are presented with the summaries.

F028AY056NV – *Populus tremuloides*-*Abies concolor*/*Rosa woodsii*/POA-CAREX

This forestland ecological site (Fig. 28) is typically found on mountain stream terraces. The soils are deep or very deep and are somewhat poorly drained. A thick, dark surface horizon is common, as well as thin organic horizons developed in decomposing leaf litter. A seasonal high water table within 100 cm of the soil surface is an important factor in this site. The vegetative community is quaking aspen (*Populus tremuloides*) and Rocky Mountain white fir (*Abies concolor*) in the overstory, with an understory dominated by Wood's rose (*Rosa woodsii*), mountain snowberry (*Symphoricarpos oreophilus*), bluegrass (*Poa*) and sedge (*Carex*). This ecological site is less than 1 percent of the area of Great Basin National Park.



Figure 28—Ecological site F028AY056NV.

F028AY074NV – *Pinus monophylla*-*Juniperus osteosperma*/*Artemisia nova*/*Pseudoroegneria spicata* ssp. *spicata*-*Achnatherum hymenoides*

This forestland ecological site is on mountain flanks and summits with any aspect. Slopes are commonly 15 to 50 percent. Elevations range from 1,740 to 2,500 meters. The soils are typically shallow or very shallow over bedrock. The soils are formed in residuum and colluvium from limestone, dolomite or other calcareous materials and typically are calcareous in some part. Available water capacity is fairly low due to the shallow soil depths and high quantities of rock fragments in the soil. The vegetation on this site is dominated by singleleaf pinyon (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) in the overstory. Below the tree canopy, black sagebrush (*Artemisia nova*) is the dominant shrub. Grasses important on the site include bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*), Indian ricegrass (*Achnatherum hymenoides*) and bluegrasses. About 1.5 percent of the Great Basin National Park area supports this ecological site.

F028AY075NV – *Pinus monophylla*-*Juniperus osteosperma*/*Artemisia arbuscula*/*Pseudoroegneria spicata* ssp. *spicata*-*Poa fendleriana*

This forestland ecological site (Fig. 29) is on mountain flanks and summits. At low elevations it is mainly on north-facing aspects, but with increasing elevation the site may occur on any aspect. Slopes

are most commonly between 30 to 75 percent. Elevations range from 1,768 to 2,286 meters. The soils are typically shallow or very shallow over bedrock. Available water capacity is rather low due to the shallow soil depths and high quantities of rock fragments in the soil. The vegetation on this site is dominated by singleleaf pinyon (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) in the overstory. Below the tree canopy, low sagebrush (*Artemisia arbuscula*) is the dominant shrub. Grasses important on the site include bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*) and muttongrass (*Poa fendleriana*). Lupine, goldenweed, phlox and rockcress are common understory forbs. Less than 1 percent of the Great Basin National Park area supports this ecological site.



Figure 29—Ecological site F028AY075NV.

F028AY076NV — *Pinus monophylla*/*Artemisia tridentata* ssp. *vaseyana*/*Pseudoroegneria spicata* ssp. *spicata*-*Poa fendleriana*

This forestland ecological site (Fig. 30) is on hills and mountain flanks and summits. Slopes are most commonly between 30 to 75 percent. Elevations range from 2,135 to 2,590 meters. The soils are typically shallow or very shallow over bedrock. Available water capacity is low due to the shallow soil depths and high quantities of rock fragments in the soil. The vegetation on this site is dominated by singleleaf pinyon (*Pinus monophylla*) in the overstory. Below the tree canopy, mountain big sagebrush (*Artemisia tridentata* Nutt. ssp. *vaseyana*) is the dominant shrub. Utah serviceberry (*Amelanchier utahensis*), antelope bitterbrush (*Purshia tridentata*) and snowberry (*Symphoricarpos*) are other important shrubs. Grasses important on the site include bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*), Indian ricegrass (*Achnatherum hymenoides*) and muttongrass (*Poa fendleriana*). Less than 1 percent of the Great Basin National Park area supports this ecological site.



Figure 30—Ecological site F028AY076NV.

F028AY077NV — *Pinus monophylla*/Cercocarpus ledifolius/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa

This forestland ecological site is on mountain flanks. It occurs on north-facing aspects at lower elevations (2,135 to 2,285 m) and on all aspects at the higher elevations ranging to about 2,450 m. Slopes are most commonly 30 to 50 percent, but range from 15 to 75 percent or more. The soils typical on this site are shallow to bedrock. There is a high volume of rock fragments throughout the soil profile, and the available water capacity is very low. The vegetation on this site is dominated by singleleaf pinyon (*Pinus monophylla*) and curleaf mountainmahogany (*Cercocarpus ledifolius*) in the overstory. The dominant shrub in the understory is mountain big sagebrush (*Artemisia tridentata* Nutt. ssp. *vaseyana*). Serviceberry (*Amelanchier*), antelope bitterbrush (*Purshia tridentata*) and snowberry (*Symphoricarpos*) are other important shrubs. Grasses important on the site include bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*), basin wildrye (*Leymus cinereus*), muttongrass (*Poa fendleriana*) and other bluegrass species. About 1.5 percent of the Great Basin National Park area supports this ecological site.

F028AY078NV — *Populus tremuloides*-*Picea engelmannii*/Symphoricarpos oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus

This forestland ecological site (Fig. 31) is on mountain flanks that are usually concave in shape. This site typically occurs at elevations ranging from 2,590 to 3,050 m or more. Slopes are most commonly 15 to 50 percent, but range from 8 to 50 percent or more. The soils typical on this site are deep or very deep and well drained. The surface layer is thick and dark with high organic matter content. There is a high volume of rock fragments throughout the soil profile, and the available water capacity is moderate. The vegetation on this site is dominated by quaking aspen (*Populus tremuloides*) and Engelmann's spruce (*Picea Engelmannii*) in the overstory. The dominant shrubs in the understory include mountain snowberry (*Symphoricarpos oreophilus*) and creeping barberry (*Mahonia repens*). Grasses and grass-like plants important on the site include mountain brome (*Bromus marginatus*), slender wheatgrass (*Elymus trachycaulus*), Cusick's bluegrass (*Poa cusickii*) and Ross' sedge (*Carex rossii*). About 1.8 percent of the Great Basin National Park area supports this ecological site.



Figure 31—Ecological site F028AY078NV.

F028AY079NV — *Populus angustifolia*/*Salix*-*Betula occidentalis*/*Carex*

This forestland ecological site (Fig. 32) is adjacent to perennial streams and riparian corridors. It typically occurs at elevations ranging from about 1,830 to 2,290 m. Slopes range from 0 to 8 percent, with slopes of 2 to 4 percent being most typical. The soils are generally very deep and drainage is somewhat poorly drained or moderately well drained. A seasonal high water table provides additional moisture to the site. A thick dark surface layer is typical due to the high organic matter content. Rock fragments are usually present in high quantities throughout most of the soil profile. The vegetation of the overstory is dominated by narrowleaf cottonwood (*Populus angustifolia*). Water birch (*Betula occidentalis*), willow (*Salix*), Wood's rose (*Rosa woodsii*), redosier dogwood (*Cornus sericea*), black chokecherry (*Prunus virginiana* L. var. *melanocarpa*), and skunkbrush sumac (*Rhus trilobata*) are the common understory shrubs and small trees. Basin wildrye (*Leymus cinereus*), bluegrass (*Poa*) and sedges (*Carex*) are the common understory grasses and grass-like plants. This ecological site occupies less than 0.1 percent of the Great Basin National Park area.



Figure 32—Ecological site F028AY079NV.

F028AY080NV — *Abies concolor*-*Pseudotsuga menziesii*/*Mahonia repens*/*Poa*

This forestland ecological site (Fig. 33) is commonly on north-facing mountain flanks. Elevation ranges from about 2,590 to 2,960 m. Slopes are typically 30 to 50 percent, but range from about 15 to 75 percent or more. The soils are generally deep and well drained. There are high volumes of rock fragments throughout the soil profile. At the soil surface, a thin organic layer of decomposed needles and twigs is common. Below the decomposing organic layer, a thin, dark layer often overlies thick layers of lower organic matter. High volumes of rock fragments are common throughout. The forest canopy is dominated by white fir (*Abies concolor*) and Douglas fir (*Pseudotsuga menziesii*). Ponderosa pine (*Pinus ponderosa* var. *scopulorum*), quaking aspen (*Populus tremuloides*), Engelmann's spruce (*Picea engelmannii*), and limber pine (*Pinus flexilis*) are sometimes present in lesser amounts. In the understory, creeping barberry (*Mahonia repens*) and mountain snowberry (*Symphoricarpos oreophilus*) are the principal shrubs. Common juniper (*Juniperus communis*) and greenleaf manzanita (*Arctostaphylos patula*) are also important shrubs in the understory. Sedges (*Carex*), Cusick's bluegrass (*Poa cusickii* Vasey ssp. *epilis*), muttongrass (*Poa fendleriana*) and other bluegrasses (*Poa*) are common on the site. Under some disturbance conditions, ponderosa pine or Douglas fir may increase significantly. This ecological site occupies about 11 percent of the Great Basin National Park area.



Figure 33—Ecological site F028AY080NV.

F028AY081NV -- *Pinus longaeva*-*Pinus flexilis*/*Ribes*-*Juniperus communis*/*Carex rossii*-*Poa*

This forestland ecological site (Fig. 34) is on mountain ridges and upper mountain flanks, typically with convex slope shapes on windswept south and west aspects. Rock outcrop and talus or rubble land are often associated features near the site. Slopes range from 2 to 75 percent, but 15 to 50 percent slopes are most common. Elevation ranges from about 2,895 to more than 3,200 m. The soils are shallow or very shallow and are usually formed in calcareous materials derived from limestone, dolomite or related carbonate rocks. Very high volumes of rock fragments are present at the soil surface and throughout the profile. As a result the soils are fairly droughty. The forest overstory is dominated by bristlecone pine (*Pinus longaeva*) and limber pine (*Pinus flexilis*). Common juniper (*Juniperus communis*), gooseberry (*Ribes*) and whitestem goldenbush (*Ericameria discoidea*) are important shrubs. Sedge (*Carex*) and bluegrasses (*Poa*) are the principal grasses and grass-like plants. This ecological site occupies about 7 percent of the area of Great Basin National Park.



Figure 34—Ecological site F028AY081NV.

F028AY082NV -- *Pinus longaeva*-*Pinus flexilis*/*Ribes*-*Juniperus communis*/*Carex rossii*-*Poa*

This forestland ecological site (Fig. 35) is on upper mountain flanks, typically with concave slope shapes. Slopes range from 2 to 75 percent, but 15 to 50 percent slopes are most common. Elevation ranges from about 2,740 to more than 3,200 m. The soils are often deep or very deep and are usually formed in calcareous materials derived from limestone, dolomite or related carbonate rocks. Very high volumes of rock fragments are present at the soil surface and throughout the profile. The available water capacity of the soil is moderate to high and the soils are well drained. The forest overstory is dominated by bristlecone pine (*Pinus longaeva*) and limber pine (*Pinus flexilis*). Common juniper (*Juniperus communis*), gooseberry (*Ribes*) and whitestem goldenbush (*Ericameria discoidea*) are important shrubs. Sedge (*Carex*) and bluegrasses (*Poa*) are the principal grasses and grass-like plants. This ecological site occupies less than 1 percent of the area of Great Basin National Park.



Figure 35—Ecological site F028AY082NV.

F028AY083NV – *Picea engelmannii*/*Ribes montigenum*/*Bromus marginatus*-*Achnatherum nelsonii* ssp. *nelsonii*

This forestland ecological site (Fig. 36) is on upper mountain flanks with northerly aspects. Slopes range from 8 to 75 percent, but 30 to 75 percent slopes are most common. Elevation ranges from about 2,740 to more than 3,350 m. The soils are often deep or very deep. Very high volumes of rock fragments are present at the soil surface and throughout the profile. A thin organic horizon is usually at the soil surface formed in decomposing needles and twigs. The available water capacity of the soil is moderate to high and the soils are well drained. Snowmelt adds to the water supply in mid- to late spring. The forest overstory is dominated by Engelmann's spruce (*Picea engelmannii*). Other trees include minor amounts of white fir (*Abies concolor*) and Douglas fir (*Pseudotsuga menziesii*). Mountain gooseberry (*Ribes monigenum*) is the primary understory shrub. Mountain brome (*Bromus marginatus*) and Columbia needlegrass (*Achnatherum nelsonii* spp. *nelsonii*) are the principal grasses. This ecological site occupies about 12 percent of the area of Great Basin National Park.



Figure 36—Ecological site F028AY083NV.

F028AY084NV – *Picea engelmannii*/*Ribes montigenum*/*Poa cusickii* ssp. *epilis*-*Carex rossii*

This forestland ecological site (Fig. 37) is on upper mountain flanks, primarily on north-facing aspects. Slopes range from 30 to 75 percent, but 30 to 50 percent slopes are most common. Elevation ranges from about 2,590 to more than 3,350 m. The soils are often very deep. Very high volumes of rock fragments are present at the soil surface and throughout the profile. A thin organic horizon is usually at the soil surface formed in decomposing needles and twigs. The available water capacity of the soil is moderate to high and the soils are well drained. Snowmelt adds to the water supply in mid- to late spring. The forest overstory is dominated by Engelmann's spruce (*Picea engelmannii*). Other trees include minor amounts of white fir (*Abies concolor*) and Douglas fir (*Pseudotsuga menziesii*) in the lower elevations. Mountain gooseberry (*Ribes montigenum*) is the primary understory shrub. Mountain snowberry (*Symphoricarpos oreophilus*) is also an important shrub. Cusick's bluegrass (*Poa cusickii*), alpine fescue (*Festuca brachyphylla*), spike trisetum (*Trisetum spicatum*), and Ross' sedge (*Carex rossii*) are the principal grasses and grass-like plants. This ecological site occupies about 3 percent of the area of Great Basin National Park.



Figure 37—Ecological site F028AY084NV.

F028AY128NV – *Pinus ponderosa* var. *scopulorum*/*Salix*/*Carex nebrascensis*

This forestland ecological site (Fig. 38) is on stream terraces, drainageways and inset fans adjacent to streams. Slopes range from 0 to 15 percent, but slopes of 4 to 15 percent are most common. Elevation ranges from 2,240 to 2,750 meters. The soils are very deep and well drained. The soils have thin organic horizons formed in decomposing needles and twigs over a thin, dark surface layer reflecting high organic matter content. Below this thin, dark-colored layer, there is little evidence of soil development. The available water capacity is reduced by very high volumes of rock fragments throughout the soil profile. Run-in moisture provides additional moisture for plant growth. The overstory is dominated by ponderosa pine (*Pinus ponderosa* var. *scopulorum*). Willow is an important component of the understory vegetation. Grasses and grass-like plants include mountain brome (*Bromus marginatus*), slender wheatgrass (*Elymus trachycaulus*), and Nebraska sedge (*Carex nebrascensis*). This ecological site occupies less than 1 percent of the area of Great Basin National Park.



Figure 38—Ecological site F028AY128NV.

R028AY004NV – Shallow Calcareous Slope 8-10” P.Z.

This rangeland ecological site is on summits and sideslopes of hills and on fan piedmont slopes. Slopes range from 8 to 75 percent, but slopes of 15 to 50 percent are most typical. Elevations range from about 1,525 to 1,980 m. The soils of this site are usually well drained soils high in lime and with a shallow rooting depth. They are frequently underlain by bedrock or cemented hardpans. A high volume of rock fragments throughout the soil reduces the available water for plant growth. The plant community is dominated by black sagebrush (*Artemisia nova*), Indian ricegrass (*Achnatherum hymenoides*) and needleandthread (*Hesperostipa comata*). This ecological site occupies less than 1 percent of the area of Great Basin National Park.

R028AY015NV – Loamy 8-10” P.Z.

This rangeland ecological site is on basin floors and on fan piedmont slopes. Slopes range from 0 to 50 percent, but slopes of 2 to 15 percent are most typical. Elevations range from about 1,525 to 1,980 m. The soils of this site are usually well drained soils high in lime that are moderately deep through very deep. The volume of rock fragments throughout the soil is variable. The plant community is dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), Indian ricegrass (*Achnatherum hymenoides*) and needleandthread (*Hesperostipa comata*). This ecological site occupies less than 1 percent of the area of Great Basin National Park.

R028AY029NV – Limestone Hill

This rangeland ecological site (Fig 39) is on hills and mountains. Slopes range from 8 to 75 percent, but slopes of 15 to 50 percent are most typical. Elevations are typically 1,830 to 2,285 m. The soils characteristic of this site are usually well drained soils high in lime and with a shallow rooting depth. They are frequently underlain by limestone or dolomite bedrock. A high volume of rock fragments throughout

the soil reduces the available water for plant growth. The plant community is dominated by littleleaf mountain mahogany (*Cercocarpus intricatus*). Black sagebrush (*Artemisia nova*), Stansbury cliffrose (*Purshia stansburiana*), Nevada greasebush (*Glossopetalon spinescens* var. *aridum*) and Scribner needlegrass (*Achnatherum scribneri*) are common on the site. This ecological site occupies about 3 percent of the area of Great Basin National Park.



Figure 39—Ecological site R028AY029NV.

R028AY034NV – Shallow Calcareous Slope 10-14" P.Z.

This rangeland ecological site (Fig. 40) is on summits and sideslopes of hills, low mountains and on fan piedmont slopes. Slopes range from 4 to 75 percent, but slopes of 15 to 50 percent are most typical. Elevations range from about 1,980 to 2,285 m. The soils of this site are usually well drained soils that are shallow to bedrock or cemented hardpans. A high volume of rock fragments throughout the soil reduces the available water for plant growth. The plant community is dominated by black sagebrush (*Artemisia nova*), Indian ricegrass (*Achnatherum hymenoides*) and bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*). This ecological site occupies less than 1 percent of the area of Great Basin National Park.



Figure 40—Ecological site R028AY034NV. Pinyon is increasing on the site.

R028AY043NV – Shallow Calcareous Loam 10-14” P.Z.

This rangeland ecological site is on fan piedmont slopes. Slopes range from 2 to 30 percent, but slopes of 4 to 15 percent are most typical. Elevations range from about 1,980 to 2,285 m. The soils of this site are usually well drained soils that are moderately deep to bedrock or cemented hardpans. A high volume of rock fragments throughout the soil reduces the available water for plant growth. The plant community is dominated by black sagebrush (*Artemisia nova*) and bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*). This ecological site occupies less than 1 percent of the area of Great Basin National Park.

R028AY055NV – Loamy Bottom 14+” P.Z.

This rangeland ecological site is on inset fans and stream terraces. Slopes range from 2 to 8 percent. Elevations range from about 2,130 to 2,590 m. The soils of this site are usually well drained or moderately well drained soils that are deep or very deep. Surface layers of the soil are thick and dark-colored, being high in organic matter. Rock fragment volume throughout the soil is typically less than 35 percent and the available water capacity is high. Additional moisture for plant growth is often supplied by run-in moisture, flooding or seasonal high water tables. The plant community is dominated by basin wildrye (*Leymus cinereus*), with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) an important shrub. This ecological site occupies less than 0.1 percent of the area of Great Basin National Park.

R028AY057NV – Loamy 16+” P.Z.

This rangeland ecological site is on toeslopes and sideslopes of mountains. Slopes typically range from 4 to 15 percent. Elevations range from about 2,440 to more than 2,895 m. The soils of this site are usually well drained soils that are deep or very deep. Surface layers of the soil are dark-colored, being high in organic matter. Rock fragment volume throughout the soil is typically high, and the available water capacity is medium to high. Snowmelt in late spring usually prolongs the availability of soil moisture for plant growth. The plant community is dominated by mountain brome (*Bromus marginatus*), slender wheatgrass (*Elymus trachycaulus*), Columbia needlegrass (*Achnatherum nelsonii*), and Letterman's needlegrass (*Achnatherum lettermanii*). Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and mountain snowberry (*Symphoricarpos oreophilus*) are important shrubs. This ecological site occupies less than 1 percent of the area of Great Basin National Park.

R028AY058NV – Stony Mahogany Savanna

This rangeland ecological site (Fig. 41) is on summits and sideslopes of mountains. Rock outcrops are often associated features near the site. Slopes range from 4 to 75 percent, but slopes of 15 to 50 percent are most typical. Elevations range from about 2,135 to 2,590 m. The soils of this site are usually well drained soils that are shallow or very shallow to bedrock. A high volume of rock fragments throughout the soil reduces the available water for plant growth. The plant community is dominated by curlleaf mountainmahogany (*Cercocarpus ledifolius*). Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is the principal understory shrub. Bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*), Letterman's needlegrass (*Achnatherum lettermanii*), and muttongrass (*Poa fendleriana*) are the dominant grasses. This ecological site occupies about 5 percent of the area of Great Basin National Park.



Figure 41—Ecological site R028AY058NV is dominated by curleaf mountainmahogany.

R028AY059NV – Mahogany Savanna

This rangeland ecological site (Fig. 42) is on sideslopes of mountains. Slopes range from 15 to 50 percent. Elevations range from about 2,135 to more than 2,745 m. The soils of this site are usually well drained soils that are shallow or moderately deep to bedrock. A high volume of rock fragments throughout the soil reduces the available water for plant growth. The plant community is dominated by curleaf mountainmahogany (*Cercocarpus ledifolius*). Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is the principal understory shrub. Bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*) and muttongrass (*Poa fendleriana*) are the dominant grasses. This ecological site occupies about 7 percent of the area of Great Basin National Park.



Figure 42—Ecological site R028AY059NV.

R028AY060NV – Mahogany Thicket

This rangeland ecological site is on concave sideslopes of mountains and mountain shoulders. Slopes range from 4 to 30 percent. Elevations range from about 2,285 to more than 2,745 m. The soils of this site are usually well drained soils that are deep or moderately deep to bedrock. A high volume of rock fragments throughout the soil reduces the available water for plant growth. The plant community is dominated by curleaf mountainmahogany (*Cercocarpus ledifolius*). Occasional singleleaf pinyon (*Pinus monophylla*), quaking aspen (*Populus tremuloides*), white fir (*Abies concolor*), and limber pine (*Pinus flexilis*) are sometimes present in small amounts. Understory shrubs and grasses are sparse. Mountain snowberry (*Symphoricarpos oreophilus*) is the principal understory shrub. Various needlegrasses (*Achnatherum* spp.) are the dominant grasses. This ecological site occupies less than 1 percent of the area of Great Basin National Park.

R028AY061NV – Claypan 14+” P.Z.

This rangeland ecological site is on summits and sideslopes of mountains. Slopes range from 2 to 50 percent, but slopes of 4 to 30 percent are most typical. Elevations range from about 2,285 to 3,050 m. The soils of this site are usually well drained soils that are shallow or moderately deep to bedrock. A fine-textured subsoil at shallow depth, an increase in rock fragments or other restriction favors the growth of low sagebrush. The plant community is dominated by low sagebrush (*Artemisia arbuscula*) and bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*). This ecological site occupies about 2 percent of the area of Great Basin National Park.

R028AY062NV – Mountain Ridge

This rangeland ecological site is on convex summits and shoulders of high mountains. Slopes range from 4 to 75 percent, but slopes of 4 to 30 percent are most typical. Elevations range from about 2,440 to more than 2,895 m. The soils of this site are usually well drained soils that are shallow or very shallow to bedrock. A high volume of rock fragments throughout the soil reduces the available water for plant growth. High winds inhibit snow accumulation and further lower the effective moisture. This plant community is dominated by low sagebrush (*Artemisia arbuscula*), muttongrass (*Achnatherum fendleriana*) and bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*). This ecological site occupies less than 1 percent of the area of Great Basin National Park.

R028AY064NV – Shallow Loam 10-14” P.Z.

This rangeland ecological site (Fig. 43) is on upper fan piedmont slopes and summits and backslopes of hills and mountains. Slopes range from 2 to 50 percent, but slopes of 8 to 30 percent are most typical. Elevations range from about 1,980 to 2,440 m. The soils of this site are usually well drained soils that are shallow to bedrock or cemented hardpans. A high volume of rock fragments throughout the soil reduces the available water for plant growth. The plant community is dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*), and Indian ricegrass (*Achnatherum hymenoides*). This ecological site occupies about 1 percent of the area of Great Basin National Park.



Figure 43—Ecological site R028AY064NV.

R028AY065NV – Shallow Loam 14+” P.Z.

This rangeland ecological site (Fig. 44) is on summits and backslopes of hills and mountains. Slopes range from 15 to 75 percent, but slopes of 15 to 50 percent are most typical. Elevations range from about 2,440 to more than 2,895 m. The soils of this site are usually well drained soils that are shallow to bedrock or cemented hardpans. A high volume of rock fragments throughout the soil reduces the available water for plant growth. The plant community is dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*). This ecological site occupies about 7 percent of the area of Great Basin National Park.



Figure 44—Ecological site R028AY065NV in foreground.

R028AY066NV – Gravelly Loam 12-14” P.Z.

This rangeland ecological site (Fig. 45) is on summits and backslopes of hills and mountains and on rock pediments. Slopes range from 4 to 75 percent, but slopes of 8 to 30 percent are most typical. Elevations range from about 1,980 to 2,380 m. The soils of this site are usually well drained soils that are shallow or moderately deep to bedrock or cemented hardpans. A high volume of rock fragments throughout the soil reduces the available water for plant growth. The plant community is dominated by antelope bitterbrush (*Purshia tridentata*). Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is also an important shrub on this site. Bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*) and Thurber's needlegrass (*Achnatherum thurberiana*) are the dominant grasses. This ecological site occupies less than 1 percent of the area of Great Basin National Park.



Figure 45—Ecological site R028AY066NV.

R028AY067NV – Calcareous loam 14+” P.Z.

This rangeland ecological site (Fig. 46) is on mountain flanks and summits with any aspect. Slopes are commonly 30 to 50 percent. Elevations range from 2,285 to 2,500 meters. The soils are typically moderately deep or deep over bedrock. The soils are formed in residuum and colluvium from limestone, dolomite or other calcareous materials and typically are calcareous in some part. Available water capacity is low to moderate due to soil depth and high quantities of rock fragments in the soil. The plant community is dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*). This ecological site occupies less than 0.1 percent of the Great Basin National Park area.



Figure 46—Ecological site R028AY067NV.

R028AY068NV – Loamy Slope 16+” P.Z.

This rangeland ecological site is on mountain flanks. Slopes range from 8 to 75 percent, but slopes of 30 to 50 percent are most common. Elevations range from about 2,440 to more than 2,895 m. The soils of this site are usually well drained soils that are moderately deep to very deep. Surface layers of the soil are dark-colored, being high in organic matter. Rock fragment volume throughout the soil is typically high, and the available water capacity is medium to high. Snowmelt in late spring usually prolongs the availability of soil moisture for plant growth. The plant community is dominated by bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*), mountain brome (*Bromus marginatus*), slender wheatgrass (*Elymus trachycaulus*), Columbia needlegrass (*Achnatherum nelsonii*), and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). This ecological site occupies less than 1 percent of the area of Great Basin National Park.

R028AY069NV – Alpine Ridge

This rangeland ecological site (Fig. 47) is on convex summits, ridges and shoulders of high mountains. Slopes typically range from 2 to 15 percent. Elevations are more than 3,200 m. The soils of this site are usually well drained soils that range from shallow to bedrock to very deep. A high volume of rock fragments throughout the soil reduces the available water for plant growth. The intense winds over the ridges and summits inhibit snow accumulation and further lower the effective moisture. Removal of snow in winter and the lack of vegetative cover in summer produce wide fluctuations of soil temperatures during the year. This plant community is mostly dominated by low-growing perennial grasses and forbs. Common grasses include alpine fescue (*Festuca brachyphylla*), Cusick's bluegrass (*Poa cusickii* Vasey ssp. *epilis*), Wheeler's bluegrass (*Poa wheeleri*), and timberline bluegrass (*Poa glauca* ssp. *rupicola*). Alpine buttercup (*Ranunculus adoneus*) is an important forb. Low-statured Engelmann's spruce (*Picea engelmannii*), bristlecone pine (*Pinus longaeva*), and limber pine (*Pinus flexilis*) sometimes occur on the margins of this site as stunted shrubs. This ecological site occupies about 3 percent of the area of Great Basin National Park.



Figure 47—Ecological site R028AY069NV.

R028AY070NV – Calcareous Alpine Ridge

This rangeland ecological site (Fig. 48) is on convex summits, ridges and shoulders of high, limestone and dolomite mountains. Slopes range from 2 to 50 percent, but slopes of 2 to 15 percent are most common. Elevations are more than 3,200 m. The soils of this site are usually well drained soils that range from very shallow to bedrock to very deep. A high volume of carbonate rock fragments throughout the soil reduces the available water for plant growth. The intense winds over the ridges and summits inhibit snow accumulation and further lower the effective moisture. Removal of snow in winter and the lack of vegetative cover in summer produce wide fluctuations of soil temperatures during the year. This plant community is mostly dominated by low-growing perennial grasses and forbs. Common grasses include alpine fescue (*Festuca brachyphylla*), Cusick's bluegrass (*Poa cusickii* Vasey ssp. *epilis*), Wheeler's bluegrass (*Poa wheeleri*), and timberline bluegrass (*Poa glauca* Vahl ssp. *rupicola*). Snowline springparsley (*Cymopterus nivalis*) and Snake Range buckwheat (*Eriogonum holmgrenii*) are important forbs. Low-statured Engelmann's spruce (*Picea engelmannii*), bristlecone pine (*Pinus longaeva*), and limber pine (*Pinus flexilis*) sometimes occur on the margins of this site as a stunted shrubs. This ecological site occupies about 1 percent of the area of Great Basin National Park.

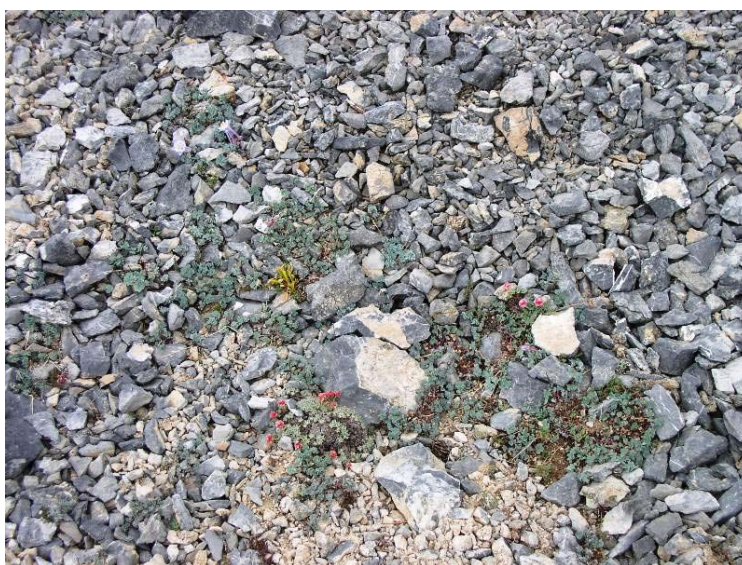


Figure 48—Ecological site R028AY070NV.

R028AY071NV –Alpine Slope

This rangeland ecological site is on high elevation mountain backslopes. Slopes range from 2 to 50 percent, but slopes of 4 to 30 percent are most common. Elevations are more than 3,200 m. The soils of this site are usually well drained soils that range from moderately deep to bedrock to very deep. A high volume of rock fragments throughout the soil reduces the available water for plant growth. Surface rock fragment volume is very high and bare soil for plant emergence and growth is reduced. This plant community is mostly dominated by low-growing perennial grasses and forbs, with lesser amounts of woody species. Common grasses and grass-like plants include slender wheatgrass (*Elymus trachycaulus*), Letterman's needlegrass (*Achnatherum lettermanii*), Ross' sedge (*Carex rossii*), Cusick's bluegrass (*Poa cusickii* Vasey ssp. *epilis*), Wheeler's bluegrass (*Poa wheeleri*), and timberline bluegrass (*Poa glauca* Vahl ssp. *rupicola*). Wax currant (*Ribes cereum*) and common juniper (*Juniperus communis*) are important shrubs. This ecological site occupies less than 1 percent of the area of Great Basin National Park.

R028AY072NV – Wet Meadow

This rangeland ecological site (Fig. 49) is on stream terraces, drainageways and floodplains adjacent to streams. Slopes range from 0 to 4 percent. Elevation ranges from 2,280 to 2,895 m. The soils are very deep and poorly drained or very poorly drained. The soils have a thick, dark surface layer reflecting high organic matter content. Below this dark-colored layer there is little evidence of soil development. The available water capacity is increased by a high water table that rises to within 50 cm of the soil surface during the growing season. Run-in moisture provides additional moisture for plant growth. The plant community is dominated by tufted hairgrass (*Deschampsia cespitosa*). Nevada bluegrass (*Poa secunda*), alpine timothy (*Phleum alpinum*), sedge (*Carex*) and clover (*Trifolium*) are important plants associated with the site. This ecological site occupies less than 0.1 percent of the area of Great Basin National Park.



Figure 49—Ecological site R028AY072NV.

R028AY073NV — Aspen thicket

This rangeland ecological site (Fig. 50) is on mountain flanks that are usually concave in shape. This site typically occurs at elevations ranging from 2,440 to more than 2,890 m. Slopes are most commonly 15 to 30 percent, but range from 4 to 75 percent or more. The soils typical on this site are deep or very deep and well drained. The surface layer is thick and dark with high organic matter content. There is a high volume of rock fragments throughout the soil profile, and the available water capacity is reduced. Heavy snow accumulation stunts the growth of the aspen, and the weight of the snow often bends the trees to a curved shape. The vegetation on this site is dominated by low-statured quaking aspen (*Populus tremuloides*) in the overstory. The dominant shrubs in the understory include mountain snowberry (*Symphoricarpos oreophilus*) and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Grasses and grass-like plants important on the site include mountain brome (*Bromus marginatus*), slender wheatgrass (*Elymus trachycaulus*), nodding brome (*Bromus anomalus*) and Ross' sedge (*Carex rossii*). This ecological site occupies less than 1 percent of the Great Basin National Park area.



Figure 50—Ecological site R028AY073NV.

R028AY087NV – Calcareous Fan Piedmont 10-14” P.Z.

This rangeland ecological site is on summits and sideslopes of fan piedmont slopes. Slopes of 4 to 15 percent are most typical. Elevations range from about 1,830 to 2,285 m. The soils of this site are usually well drained soils that are moderately deep to bedrock to very deep. A high volume of carbonate rock fragments throughout the soil reduces the available water for plant growth and adds carbonate to the soil. The plant community is dominated by black sagebrush (*Artemisia nova*), wild crab apple (*Peraphyllum ramosissimum*) and bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*). This ecological site occupies less than 0.1 percent of the area of Great Basin National Park.

R028AY091NV – Loamy Fan 10-14” P.Z.

This rangeland ecological site is on inset fans and stream terraces. Slopes range from 2 to 4 percent. Elevations range from about 2,040 to 2,440 m. The soils of this site are usually well drained soils that are

deep or very deep. Surface layers of the soil are dark-colored, being high in organic matter. Rock fragment volume throughout the soil is typically less than 35 percent and the available water capacity is high. Additional moisture for plant growth is often supplied by run-in moisture. The plant community is dominated by basin wildrye (*Leymus cinereus*), with basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) an important shrub. This ecological site occupies less than 0.1 percent of the area of Great Basin National Park.

R028AY092NV – Loamy 12-14” P.Z.

This rangeland ecological site (Fig. 51) is on summits and backslopes of hills and mountains. Slopes range from 2 to 30 percent, but slopes of 2 to 15 percent are most typical. Elevations range from about 2,130 to 2,380 m. The soils of this site are usually well drained soils that are moderately deep to bedrock to very deep. Rock fragments present in the soil reduces the available water for plant growth. The plant community is dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Antelope bitterbrush (*Purshia tridentata*) is also an important shrub on this site. Bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*) and various needlegrasses (*Achnatherum*) are the dominant grasses. This ecological site occupies less than 0.1 percent of the area of Great Basin National Park.



Figure 51—Ecological site R028AY092NV.

R028AY095NV – Loamy 10-12” P.Z.

This rangeland ecological site is on summits and backslopes of hills and on upper fan piedmont slopes. Slopes range from 2 to 30 percent, but slopes of 2 to 15 percent are most typical. Elevations range from about 1,950 to 2,280 m. The soils of this site are usually well drained soils that are moderately deep to bedrock to very deep. Rock fragments present in the soil reduces the available water for plant growth. The plant community is dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*). Bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*), needleandthread (*Hesperostipa comata*) and Thurber's needlegrass (*Achnatherum thurberianum*) are the dominant grasses. This ecological site occupies less than 1 percent of the area of Great Basin National Park.

R028AY102NV – Shallow Calcareous Hill 10-14” P.Z.

This rangeland ecological site (Fig. 52) is on summits and sideslopes of hills and mountains. Slopes range from 4 to 75 percent, but slopes of 8 to 50 percent are most typical. Elevations range from about 1,980 to 2,285 m. The soils of this site are usually well drained soils that are shallow to bedrock or cemented hardpans. A high volume of carbonate rock fragments throughout the soil reduces the available water for plant growth and adds carbonate to the soil. The plant community is dominated by black sagebrush (*Artemisia nova*) and Indian ricegrass (*Achnatherum hymenoides*). Other important species associated with this site include Stansbury cliffrose (*Purshia stansburiana*), and bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*). Singleleaf pinyon (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) are components of this site and are often visually dominant as they increase on the site. This ecological site occupies about 3 percent of the area of Great Basin National Park.



Figure 52—Ecological site R028AY102NV.

R028AY127NV – Loamy Fan Piedmont 12-14” P.Z.

This rangeland ecological site is on summits and sideslopes of fan piedmont slopes. Slopes of 2 to 8 percent are most typical. Elevations range from about 1,770 to 2,805 m. The soils of this site are usually well drained soils that range from shallow to bedrock or hardpan to very deep. A high volume of carbonate rock fragments throughout the soil reduces the available water for plant growth and adds carbonate to the soil. The plant community is dominated by mountain big sagebrush (*Artemisia tridentata*

ssp. vaseyana), Stansbury cliffrose (*Purshia stansburiana*), wild crab apple (*Peraphyllum ramosissimum*) and bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*). This ecological site occupies less than 0.1 percent of the area of Great Basin National Park.

R028AY129NV –Alpine Meadow

This rangeland ecological site (Fig. 53) is on concave depressions on summits and ridges of high mountains. Slopes range from 2 to 15 percent, but slopes of 2 to 4 percent are most common. Elevations are more than 3,200 m. The soils of this site are usually well drained soils that range from moderately deep to bedrock to very deep. A high volume of rock fragments throughout the soil reduces the available water for plant growth. Run-in moisture from adjacent soils provides some additional moisture to this site. The plant community is dominated by low-growing perennial grasses and forbs. Common grasses and grass-like plants include Ross' sedge (*Carex rossii*), dunhead sedge (*Carex phaeocephala*), and Wheeler's bluegrass (*Poa wheeleri*). Cushion phlox (*Phlox pulvinata*) is an important forb. This ecological site occupies less than 0.1 percent of the area of Great Basin National Park.



Figure 53—Ecological site R028AY129NV.

R028BY103NV – Stream Type B

This rangeland ecological site is on stream terraces, floodplains and along seeps and springs. It consists of several related soil-hydrologic regime-vegetative community types that are found in the riparian areas associated with Rosgen's stream type B. The plant community identified in the area consists mainly of tufted hairgrass (*Deschampsia cespitosa*), Western chokecherry (*Prunus virginiana* var. *demissa*), Wood's rose (*Rosa woodsii*) and willow (*Salix*). Nevada bluegrass (*Poa secunda*) and sedge (*Carex*) are also important plants associated with this site. This ecological site occupies less than 0.1 percent of the area of Great Basin National Park.

Management of Rangeland and Forestland

Proper land management can improve present rangeland and forestland health and productivity, while preventing accelerated erosion. Multiple use management to meet present and future needs requires extensive knowledge of the resource capabilities and limitations. An understanding of the dynamics of native plant communities and the properties of associated soils is fundamental in applying ecological principals to natural resource evaluation and management.

Rangeland management requires knowledge of the kinds of soils and the potential plant communities these soils can support in a given area. A state and transition model is used to describe vegetation dynamics and management interactions associated with each ecological site. The model provides a method to organize and communicate complex information about vegetation response to disturbances and management. A state includes one or more biological (including soil) communities that occur on a particular ecological site and that are functionally similar with respect to soil/site stability, hydrologic function, and biotic integrity. States are generally distinguished by relatively large differences in plant functional groups, dynamic soil properties, and ecosystem processes, and consequently in vegetation structure, biodiversity, and management requirements. They are also distinguished by their responses to disturbance. A number of different plant communities may be included in a state, and the communities are often connected by community pathways.

Shifts between states are referred to as “transitions”. Unlike community pathways, these “threshold” transitions are not reversible by simply altering the intensity or direction of factors that produced the change. Transitions among states in an ecological site are often caused by a combination of feedback mechanisms that alter soil and plant community dynamics.

The reference state is the state where the functional capacities represented by soil/site stability, hydrologic function, and biotic integrity are performing at a near optimum level under the natural disturbance regime. The reference state is used for the rangeland health evaluation, although managers may choose to manage communities in another state.

Three assessment tools, similarity index, trend, and rangeland health evaluations, can be used to evaluate a rangeland site. Similarity index is an index of where the current plant community is in relation to the historic climax plant community, or to a desired plant community that is one of the site's potential vegetation states. Trend is a determination of the direction of change in the current plant community and associated soils in relation to the historic climax plant community or some other desired plant community. Rangeland health is defined as the degree to which the integrity of the soil, vegetation, water, and air as well as the ecological processes of the rangeland ecosystem are balanced and sustained. A rangeland health assessment is designed to provide a preliminary evaluation of soil/site stability, hydrologic function, and integrity of the biotic community. This assessment can also provide early warnings of potential problems and opportunities.

Managing a forest to produce vegetation for desired wildlife habitat, water quality, and quality fisheries requires an understanding of the forest ecosystem and how it responds. In most forests, solar energy is the major ecological component affected in the management process. Solar energy is intercepted by the canopy of the tallest trees. This causes a filtering or reduction of solar energy as it penetrates to the next layer of vegetation, whether it is a midstory of woody plants or grasses and forbs growing on the forest floor. Managing the forest ecosystem for the desired plant community and the desired production is, in a large part, accomplished by managing the plant populations in the different stories (overstory, midstory, and understory) to provide the most efficient use of solar energy by the desired plants.

One of the primary factors leading to poor tree health is too many closely spaced trees. Thinning, the selective removal of individual trees, is an important management practice that improves tree health and vigor and decreases wildfire potential.

Vegetation Zones

Great Basin National Park is in the southeastern portion of the Basin and Range Physiographic Province (Fenneman 1931). Major plant associations within the soil survey area typify the general

zonation of vegetation common to the Great Basin Region. Valley floors and lower piedmont slope landscapes, adjacent to the park, are dominated by salt-desert shrub plant communities. On landscape positions above the salt-desert shrub zone, sagebrush-grass plant communities are prevalent where mean annual precipitation is 8 inches or more. Above the 10 inch precipitation zone are areas of Utah juniper and above 12 inches of precipitation are singleleaf pinyon and Utah juniper communities. Above the singleleaf pinyon and Utah juniper forest's upper elevation limit, occur high elevation sagebrush and forest communities. The highest elevations of the survey area are dominated by alpine tundra plant communities.

Sagebrush Zone

The Sagebrush Zone within the survey area is represented in valleys, and mountains from 5,000 to 7,000 feet. Average annual precipitation at these elevations is from 8 to 16 inches or more.

Low elevation sagebrush-grass plant communities receive about 8 to 12 inches of annual precipitation. Black sagebrush, Wyoming big sagebrush, and to a lesser extent, basin big sagebrush are the dominant sagebrush taxa. Perennial grasses are potentially the dominant herbaceous vegetation of sagebrush-grass plant communities in the survey area. Common perennial grasses include basin wildrye, bluebunch wheatgrass, galleta, Indian ricegrass, needleandthread, bottlebrush squirreltail, and Sandberg bluegrass. Livestock pressure on these sagebrush-grass plant communities has historically been severe, and may have eliminated the perennial grass and forb understory.

Mid-elevation sagebrush-grass plant communities receive about 12 to 18 inches of annual precipitation. Mountain big sagebrush or low sagebrush dominate the canopy of these communities. Other species include Thurber's needlegrass, muttongrass, bluebunch wheatgrass, basin wildrye, and antelope bitterbrush.

The encroachment of singleleaf pinyon and Utah juniper into low and mid-elevation sagebrush-grass plant communities has become more prevalent in the survey area in the last century. This is due to a combination of fire suppression, climate change, and past historical use. As competition for water and nutrients increases, shrubs and herbaceous plants, decline in the understory. Tree canopy closure leads to a state dominated by singleleaf pinyon and Utah juniper with essentially no understory. Ecological sites, in this tree dominated state, are susceptible to increased soil erosion. Depending on the level of conifer encroachment, recovery following wildfire or other natural disturbances may be delayed significantly due to suppression of the understory and seed bank depletion.

Singleleaf Pinyon and Utah Juniper Zone

The singleleaf pinyon and Utah juniper zone includes the singleleaf pinyon and Utah juniper plant communities. Elevations range from 5,200 to about 8,500 feet and precipitation ranges from about 10 to 22 inches. Dominant understory shrubs include mountain big sagebrush, low sagebrush, black sagebrush, littleleaf mountainmahogany or curleaf mountainmahogany. Prevalent understory grasses are bluebunch wheatgrass, muttongrass, Indian ricegrass, bottlebrush squirreltail, and Sandberg's bluegrass.

During the mining booms of the late 1800's, much of White Pine County's forest resource was harvested for use in ore processing, as mine props, or burned as domestic firewood. Large portions of the pinyon and juniper forest were harvested and therefore support trees less than 150 years of age. These areas represent re-growth after the early mining boom period. In the areas that were harvested there are trees younger than 150 years, but the old ax-cut stumps prove that the site historically supported forests.

Settlement in the survey area has also reduced the incidence and size of natural fires through fire suppression and the disruption of fine fuel continuity by historic livestock grazing. With changes in the extent and frequency of natural fire, significant changes in the character of pinyon-juniper forests and associated rangeland have occurred. Original forests that were not harvested for the mining industry have become denser and adjacent sagebrush-grass communities have been invaded by these trees.

Pinyon and juniper woodlands are generally low in productivity at low elevations and on south and southwest aspects where juniper is the dominant tree species. At higher elevations, the woodland is more productive where pinyon is dominant in the overstory.

In the pristine environment, stands of pinyon and juniper were restricted to very rocky soils and landscape positions that prevented naturally occurring wildfires. Young pinyon and juniper trees are very susceptible to ground fires until their crowns grow well above the sagebrush-grass vegetation. Fire

usually eliminates or greatly reduces the number of tree seedlings on soils that produce continuous stands of fine fuels. Production of fine fuels is restricted on soils that are droughty, shallow and/or stony. A sparse stand of fine fuels reduces the frequency and extent of wildfires and provides "safe" sites for stands of pinyon and juniper to develop.

Traditional products of the pinyon-juniper forests include firewood, fence posts, pine nuts and Christmas trees. As energy demands and costs increase, firewood harvesting becomes more important as a forest product. Other uses are livestock grazing, wildlife food and cover, recreation and watershed protection.

Tree production should be encouraged on sites known to be productive or on soils that originally supported pinyon-juniper forest. Invasion of pinyon or juniper into sagebrush-grass rangeland should be controlled to prevent loss of forage production and potential degradation of the rangeland resource. When developing a forest management plan, it is important to evaluate the soil and site potentials. Consideration should be given to all forest values, site opportunities and economic factors.

Understory vegetation consists of grasses, forbs, shrubs, and other plants. Some forests, if well managed, can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees or understory.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, the amount of litter accumulation and level of tree competition for soil moisture and nutrients.

Areas where there is presently a heterogeneous mix of vegetative types including grassland, low shrub, tall shrub and tree/shrub communities usually provide an optimum diversity of habitat and wildlife. These types of vegetative complexes are common in the mid- and upper elevation sagebrush-grass zones within the survey area.

Montane Zone

The Montane Zone includes the sagebrush-grass communities, mountainmahogany communities, mixed conifer forests, and subalpine conifer forests at elevations from approximately 8,000 to 11,000 feet. Average annual precipitation ranges between 18 to over 35 inches at these elevations within the survey area.

Mountain big sagebrush or low sagebrush dominate the canopy of the sagebrush-grass plant communities. Understory grasses include mountain brome, slender wheatgrass, Letterman's needlegrass, and bluebunch wheatgrass. Mountain snowberry and Utah serviceberry, as well as antelope bitterbrush, are common in the shrub overstory.

Mountainmahogany stands often occur in association with bedrock outcroppings on mountain sideslopes. Littleleaf mountainmahogany plant communities commonly occur adjacent to or intermixed with singleleaf pinyon and Utah juniper woodlands. This plant community occurs at elevations ranging from about 6,000 to 8,000 ft. This plant community is dominated by littleleaf mountainmahogany with an understory comprised of black sagebrush, Stansbury cliffrose, Scribner's needlegrass, and galleta. This plant community is generally located on steep mountain sideslopes with shallow soils.

Curlleaf mountainmahogany stands are found at elevations of about 7,500 to over 9,500 feet on mountain summits and upper side slopes. Mountain big sagebrush, bluebunch wheatgrass, needlegrasses and muttongrass dominate the understory of this plant community. Curlleaf mountainmahogany density varies with soil depth. Deeper soils support a more dense overstory of curlleaf mountainmahogany and the understory is correspondingly reduced.

Extensive mixed conifer forests generally occur on steep mountain sideslopes with elevations of 8,500 to 9,700 feet. This plant community is dominated by a mixed stand of Rocky Mountain white fir, Rocky Mountain ponderosa pine, and Rocky Mountain Douglas fir. The understory plant community includes creeping barberry, mountain snowberry, common juniper, greenleaf manzanita, sedges, and bluegrasses. In the absence of wildfire or other naturally occurring disturbances, the tree canopy on this site can become very dense. This stage is dominated by Rocky Mountain white fir which has reached maximal heights for the site. Understory vegetation is sparse due to tree competition, overstory shading, and duff accumulation. Major shifts in species composition occur following wildfire. Fire intolerant species such as Rocky Mountain white fir, Rocky Mountain Douglas fir, are readily removed by even low intensity fires while Rocky Mountain ponderosa pine is fire tolerant and will persist following low intensity fires.

Upland aspen stands occur at elevations from 8,000 to 10,000 feet within this survey area. Upland aspen stands are divided into two types, aspen forests and aspen thickets. The aspen forest overstory is comprised primarily of quaking aspen with a small percentage of the overstory comprised of Engelmann's spruce, Rocky Mountain white fir, and limber pine. The productive understory is comprised of mountain brome, slender wheatgrass, skyline bluegrass, Ross' sedge, mountain snowberry, and creeping barberry. Wildfire is recognized as a natural disturbance that influenced the structure and composition of the climax vegetation of this woodland site. Periodic wildfires prevent over-mature aspen stands, reduce the conifer cover, and maintain a naturally stratified mosaic of aspen communities in various stages of successional development.

Aspen thickets are dominated by dense low-growing quaking aspen exhibiting a stunted growth form and are usually not more than 15 feet tall at maturity. They are generally associated with snow accumulation zones or snow pockets. Normally each aspen thicket is comprised of a single aspen clone. The overstory is comprised of quaking aspen with Rocky Mountain white fir and Rocky Mountain juniper occurring sporadically throughout the canopy. Important understory species include mountain brome and nodding brome, slender wheatgrass, needlegrasses, mountain big sagebrush, and mountain snowberry.

The subalpine forests occur from about 9,000 to 11,000 feet and are dominated by Engelmann spruce, limber pine and the long-lived Great Basin bristlecone pine. Engelmann spruce dominates mountain slopes with cool, north and northeast aspects. The understory of Engelmann spruce forest is dominated by mountain gooseberry, western raspberry, mountain snowberry, needlegrasses, and mountain brome. Warmer, dryer aspects and exposed slopes within this elevation range are dominated by an overstory of Great Basin bristlecone and limber pine. Great Basin bristlecone pine growing on high elevation, wind swept slopes often cease growing taller, but diameter growth continues, forming a characteristic gnarled growth form. A bristlecone pine near Wheeler Peak was dated to be more than 4,900 years old in 1964. Understory vegetation is comprised of Ross' sedge, bluegrasses, gooseberry, whitestem goldenbush, and common juniper.

Alpine Tundra Zone

The highest elevations from about 10,500 to 13,063 feet extend above timberline and support alpine tundra plant communities. These communities are dominated by short statured grasses, sedges, and forbs. Common sedges and grasses include Ross' sedge, dunhead sedge, Letterman's needlegrass, alpine fescue, skyline bluegrass, Wheeler's bluegrass, and timberline bluegrass. Common shrubs include wax currant, whitestem goldenbush, and mountain snowberry. The few trees which exist at these high elevations exhibit a "krummholz" growth form. These trees are short statured and branches are located almost exclusively on the leeward side of the tree where the trunk provides some protection from blowing snow and ice.

Alpine tundra communities are sensitive to disturbance and the effects of disturbance are more drastic and long-lasting than in other plant communities. Vegetation recovery is slow because of the cold and extreme temperatures, high winds, prolonged thin mantle of snow, and intense ultraviolet radiation.

Riparian Plant Communities

Riparian areas or meadows are interspersed throughout the survey area but many are found in the sagebrush-grass community. Riparian vegetation occurs along the main stream channels and is dominated by species of willow, water birch, and Wood's rose. Sedges and rushes are common understory species. Meadow vegetation also occurs on the periphery of seeps and springs. These riparian zones are disproportionately important for the relatively small amount of total area they represent in the survey area. The importance of riparian zones is related primarily to the presence of free water, the greater productivity and length of growing period of the riparian vegetation influenced by this extra moisture, and the diversity of plant species as well as the structural diversity of the riparian vegetation. Riparian zones along stream channels are typically long and winding in nature, which maximizes the edge effect between them and the adjacent upland areas.

Low elevation riparian areas are characterized by an overstory canopy of narrowleaf cottonwood and an understory dominated by water birch, willows, Wood's rose, redosier dogwood, common chokecherry, and skunkbrush sumac. Basin wildrye, bluegrass, and sedges are the most prevalent understory grasses.

Within this plant community, water birch and willows grow in the wettest areas, while narrowleaf cottonwood occupies slightly dryer areas. Within this elevation range also occur stream corridors dominated by bitter cherry. With an understory generally dominated by bluegrass, basin wildrye and sedges. These areas generally have dryer soils with a seasonally high water table.

Riparian communities in the singleleaf pinyon and Utah juniper zone and Montane zone are characterized by two primary overstory types: Rocky Mountain ponderosa pine and quaking-aspen. Quaking aspen-dominated riparian areas are generally found in areas with a seasonally high water table. The overstory of this plant community is dominated by quaking aspen. Other tree species such as Engelmann spruce, limber pine, Rocky Mountain Douglas-fir, and Rocky Mountain juniper make up a small percentage of the overstory composition. Bluegrasses, sedges, slender wheatgrass, mountain brome, yarrow, meadowrue, Wood's rose, mountain snowberry, and water birch, are common understory species. Fire historically has played an important role in controlling the encroachment of conifers, primarily Rocky Mountain white fir, into aspen dominated riparian plant communities. In the absence of fire, conifers will come to dominate the site and minimize the occurrence of aspen in the plant community.

Ponderosa pine dominates riparian areas without a seasonally high water table. The overstory of this plant community is dominated by ponderosa pine; other tree species such as Rocky Mountain white fir, Rocky Mountain Douglas-fir, Rocky Mountain juniper and Quaking aspen make up a small percentage of overstory composition. Bluegrasses, sedges, slender wheatgrass, yarrow, meadowrue, Wood's rose, willow, cinquefoil and currant are common understory species. In the absence of frequent cool ground fires, Rocky Mountain white fir and other ladder fuels may increase to such a point that the risk of a stand replacing fire increases substantially.

Wet meadow vegetation occurs along stream channels and on the periphery of seeps and springs. This site has a high water table throughout the growing season. This plant community is dominated by tufted hairgrass, Nevada bluegrass, alpine timothy, clover, and meadow sedges.

The riparian areas of the alpine tundra zone mainly are restricted to springs, seeps, snow pockets, and bogs. Although small and few, these sites of permanent water during the growing season contribute greatly to the plant species richness of the zone.

Wildlife Considerations

Jaime Jasmine, Wildlife Biologist, Natural Resources Conservation Service helped write this section

When assessing the impact of vegetation manipulation on wildlife, it is important to consider the role "edges" play in wildlife habitat. An "edge" or ecotone is a transition between plant communities or where vegetative structure within plant communities comes together. These edges are commonly richer in wildlife than either of the adjoining communities. The structure and dominance of plants remaining after the vegetation has been manipulated, differs with the treatment method used.

There are many treatment methods used to create desired habitat. Fire or prescribed burning is one method to change or alter habitats. If the fire is intense all vegetation, including the skeletons or woody portions of shrubs, is removed. This eliminates the structure of woody vegetation from the area. Mule deer, antelope, elk, and many non-game species often utilize the lush vegetation that grows in the recently burned areas. Low intensity fires can also be utilized to rejuvenate grasses and forbs without removing the woody component.

Chemical application is an alternative to burning when creating habitat. Using herbicides to treat areas of brush creates slower change in the vegetative structure. Herbicides leave the dead skeletons of shrubs standing longer than burning and the shrub structure is retained. Antelope usually avoid areas having this dead shrub structure for several years after treatment. A side affect of herbicide control is the inadvertent killing of broad-leaved forbs in the shrub understory. Forbs are a staple part of the diet of sage grouse and antelope.

Mechanical means of brush removal is another option of brush removal in the arid west. Chaining, and to a lesser degree, brush beating, change the vegetative structure from tree/shrub or shrub to grassland. The residue left on the ground creates microhabitat for small mammals and birds.

Manipulation of sagebrush within sage-grouse occupied ranges must be undertaken with careful planning. Optimum brood rearing habitat for sage grouse is characterized by a 10 to 25 percent canopy

cover of sagebrush that is 16 to 32 inches high with herbaceous understory of 15 percent grass canopy and 10 percent forb canopy cover (Nevada Department of Wildlife, 2004). Some treatment of sagebrush, such as reducing cover from 40 to 20 percent may not seriously degrade sage grouse nesting habitat and can often provide higher quality sage grouse forage. Timing of brush manipulation is also an important consideration in sage-grouse habitat. The sage grouse is a habitat-specific bird, relying primarily on sagebrush to meet its life requirements. Plans for manipulation of sagebrush stands on ranges occupied by sage grouse should provide for the maintenance of suitable sage grouse habitat, especially nesting habitat near strutting grounds or "leks".

More than half of all wildlife species in the survey area are dependent upon riparian plant communities for a significant portion of the year. Riparian communities also support wildlife not common to desert ecosystems. Riparian communities create islands of habitat in desert environments for migrating birds. Species such as nuthatches and warblers, which nest in forest ecosystems, can be found in desert riparian zones during the spring and fall. These riparian communities are not only areas of concentration for wildlife, but also recreational users.

Reducing big sagebrush cover can benefit mule deer, elk, and pronghorn antelope where the habitat needs of these animals are properly identified and planned for in the manipulation of vegetation. Extensive areas dominated by big sagebrush are marginal pronghorn antelope habitat and these areas can be treated to decrease the density and height of sagebrush. Removal of big sagebrush to enhance the diversity of understory grasses and forbs or to increase production of green forage on transitional range where shrub cover is excessive can benefit mule deer and elk.

Sagebrush Zone

Although these sagebrush-grass communities may provide transitional range in the spring to pronghorn antelope moving from winter to summer ranges, plant communities dominated by big sagebrush are not heavily used by pronghorns. Water developments are beneficial to wildlife, especially deer and antelope, if the water supply is available when they occupy the area. Sage grouse may use these areas during severe winter periods to feed on sagebrush that has not been snow-covered. Heavy snow at higher elevations will move chukar partridge onto these communities where feed is available. Low elevation sagebrush-grass communities within the survey area are used primarily by mule deer as winter range or as transitional range in the spring. Elk may also use these areas in years of large snow accumulations at higher elevations.

Meadow vegetation also occurs on the periphery of seeps and springs. Wet meadows adjacent to sagebrush stands are important sage-grouse brood-rearing areas. The diet of sage-grouse chicks during the first weeks after leaving the nest is primarily insects (ants and beetles) and succulent forbs that are common to wet meadows. Sage grouse chicks also benefit from the horizontal and vertical cover provided by meadows and adjacent shrub cover.

Singleleaf Pinyon and Utah Juniper Zone

Pinyon-juniper woodlands provide shelter and forage for numerous species of wildlife, some of which may be obligate to these woodlands such as pinyon mice and bushy-tailed woodrats. Non-game wildlife species associated with these woodlands are the blue-grey gnat-catcher, pinyon jay, and the American kestrel. Mule deer will also use these woodland communities for thermal cover. Rocky Mountain elk are found throughout the survey area and they rely heavily on the pinyon-juniper plant communities for most of their life cycles. The pinyon-juniper areas provide them with the feed and cover that they need to survive year round.

Brush and tree treatments such as chainings in these pinyon-juniper areas can greatly benefit wildlife. By removing some of the encroached pinyon-juniper, understory grasses and forbs will once again receive the sunlight and nutrients they need to grow and flourish. In areas with complete canopy cover, range seeding may be necessary to have successful chaining results. These chained areas make great habitat for elk, small mammals, and birds.

Montane Zone

High elevation plant communities supply mule deer, elk and bighorn sheep with exceptional summer range. The high elevation basins also support many small mammal and bird species.

There tends to be much diversity at these high elevations since there is an increased amount of precipitation. Seedlings in these areas are not usually needed as there is usually a sufficient seed source available after any type of disturbance.

Mule deer, bighorn sheep, and elk will use these high elevation sites from early in the spring when the snow melts to early winter. These areas have more than sufficient feed and cover for deer. Bighorn sheep also prefer rock outcrops to evade predators. Springs and meadows in this region are common and tend to be the areas that all wildlife life revolves around. Care should be taken to protect these water sources and spring developments that protect these springs can be beneficial to wildlife.

Alpine Tundra Zone

There are only a handful of species that utilize the harsh environment of the alpine tundra plant community. Nutcrackers, jays, chickadees, bushtits, warblers, and wrens are all summer residents of the alpine tundra plant community.

Rehabilitation of Disturbed Habitats

Rangeland seeding may be required following the removal of woody vegetation in areas where desirable understory plants are scarce or are not included in the present plant community. Revegetation also may be necessary for critical area treatment following a wildfire or other major disturbance. Water developments can be beneficial to wildlife, especially deer, elk and pronghorns, if the water supply is available when they occupy the area. Water developments are also beneficial for birds and bats. The developments should contain escape ramps for birds and be free of obstructions for bats to drink on the fly. Forage for wildlife, such as pronghorn antelope, mule deer, and sage grouse can be enhanced if adapted forbs are included in the seeding.

The success of range seeding depends on the amount of moisture available during the growing season. Even in areas where adapted species are planted and improved seeding and land treatment techniques are applied, the success of range seeding is strongly influenced by rainfall. The distribution and amount of precipitation in the survey area fluctuate widely from one year to the next. Years of below normal precipitation are relatively frequent, and the risk of seeding failure caused by the unpredictability of climate should be acknowledged in addition to critical soil properties that affect seeding success.

Where critical area treatment is necessary, providing a plant cover that helps to prevent accelerated erosion may be advantageous on soils that are poorly suited to range seeding. The plants that are suited to the soils in the area to be treated should be selected for seeding.

Other information regarding rangeland and forest management, wildlife, and rangeland seedings discussed in this survey can be obtained by contacting the local Natural Resource Conservation Service or the local Cooperative Extension office.

Forestland Productivity and Management

The tables described in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forestland management.

Forestland Productivity

Table 9, "Forestland Productivity," the potential productivity of merchantable or common trees on a soil is expressed as a site index and as a volume number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the "National Forestry Manual," (Natural Resources Conservation Service, 1998) which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The volume of wood fiber, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Forestland Management

The titles of the tables described in this section are:

Table 10, "Forestland Site Preparation"

Table 11, "Haul Roads and Soil Rutting on Forestland"

Table 12, "Land Management - Hazard of Erosion and Suitability for Roads"

Table 13, "Land Management - Site Restorations"

In these tables, interpretive ratings are given for various aspects of forestland management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified aspect of forestland management. *Well suited* indicates that the soil has features that are favorable for the specified management aspect and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates that the soil has features that are moderately favorable for the specified management aspect. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified management aspect. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified management aspect or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for fire damage and seedling mortality are expressed as *low*, *moderate*, and *high*. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

For *limitations affecting construction of haul roads*, the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates that no significant limitations affect construction activities, *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forest equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

Ratings in the column *hazard of erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may

be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the column *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Ratings in the column *potential for seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Recreational Development

The titles of the tables described in this section are:

Table 14, "Camp and Picnic Areas"

Table 15, "Trails Management"

In the tables described in this section, the soils of the survey area are rated according to limitations that affect their suitability for recreational development. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in these tables can be supplemented by other information in this survey, for example, interpretations for dwellings without basements, for local roads and streets, and for septic tank absorption fields.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic

areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Foot traffic and equestrian trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Mountain bike and off-road vehicle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Sanitary Facilities

Table 16, "Sewage Disposal", shows the degree and kind of soil limitations that affect septic tank absorption fields and sewage lagoons. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope

must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Water Management

Table 17, "Ponds and Embankments", gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Construction Materials

The titles of the tables described in this section are:

Table 20, "Source of Gravel and Sand"

Table 21, "Source of Reclamation Material, Roadfill, and Topsoil"

These tables give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

Gravel and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 20, "Source of Gravel and Sand," only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good*, *fair*, or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

In table 21, "Source of Reclamation Material, Roadfill, and Topsoil," the rating class terms are *good*, *fair*, and *poor*. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of reclamation material, roadfill, and topsoil. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and

slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Properties

Table 22, "Engineering Properties," described in this section gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the "content of particles coarser than sand" is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade

material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical Properties of Soils

Table 23, "Physical Properties of Soils," described in this section shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In table 23, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 23, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in micrometers per second, when the soil is saturated.

They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, including rock fragments, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (K_w and K_f) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor K_w indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor K_f indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties of Soils

Table 24, "Chemical Properties of Soils," described in this section shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Water Features

Table 25, "Water Features," described in this section gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A.—Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B.—Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C.—Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D.—Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 26, "Soil Features," described in this section gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2006). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The categories are defined in the following paragraphs.

Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisols.

Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Cryoll, *cry*, meaning cold, plus *oll*, from Mollisol.

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplocryolls *Hapl*, meaning minimal horizonation, plus *cryolls*, the suborder of the Mollisols that has a cold soil temperature.

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Xeric* identifies the subgroup that has a xeric moisture regime. An example is Xeric Haplocryolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is loamy-skeletal, mixed, superactive, Xeric Haplocryolls.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. Berrycreek is an example of a series within the family loamy-skeletal, mixed, superactive, Xeric Haplocryolls.

Table 25, "Taxonomic Classification of the Soils", lists the name of each soil series used in the soil survey and its classification. Classifications are based on Keys to Soil Taxonomy, 10th edition, (Soil Survey Staff, 2006).

Soil Series in Great Basin National Park

Fifty seven soil series are recognized as major soil components in the soil map units of Great Basin National Park. A number of less extensive, but contrasting soils are also recognized as minor soil components in soil map units. Each series exists on a characteristic landform or landscape and is

influenced by characteristic parent material(s) and geologic origin. Climatic influences and age of the soils are also major factors in the development of soils. Plant communities and animals that are adapted to the unique conditions created by the interaction of soil and climate have added their influences to the soil as it forms over time. The variety of soil series that may occur because of these factors is especially pronounced in mountainous regions such as Great Basin National Park, where soils frequently occur in complex patterns.

The extent of individual soil series is also quite variable, as may be observed on the lands in and around the Great Basin National Park. The park is located on a large portion of the Snake Range and extends onto some of the adjacent alluvial fan piedmonts. The topography of the mountains impacts the extent of soil series in the park. The mountainbase is wider than its summits and ridges. Correspondingly, the soils that are found at the high elevations on mountains and ridges are generally less extensive than soils occurring farther down on the mountainflank or at its base, although the extent of high elevation slopes with uniform geology, such as are found in the Wheeler Peak vicinity, can likewise contribute to large soil extents. Soils formed on the adjacent alluvial fan piedmonts are often of significant extent as well. It is interesting to note that the soils are natural features that are not constrained by political boundaries, such as the park boundary or a state line. A number of soils continue past the park boundary and some even are found in other mountain ranges and fan piedmonts in the Great Basin region. As a result, discussions of series extent in the Great Basin National Park must recognize that both natural and political boundaries impact that extent.

During mapping, soil scientists attempt to map the soil as it occurs as a natural body, without undue consideration to the political or management boundaries that may divide the natural bodies. Field investigations at any point in the natural body of soil are considered representative regardless of where political boundaries may occur. Some of the series in this survey area are typified by soils described outside the park boundary, but are in close proximity to the park. Where this is the case, the location of the soil description is noted as being outside the park. The Eenreed series is an example. It is typified by a description in a portion of the Snake Range Area, Nevada soil survey, which is adjacent to the Great Basin National Park. The location of the soil description is about 1,600 feet north of the boundary. However, it is part of the natural body of Eenreed soil that is on either side of the boundary.

Some soils occur within the Great Basin National Park primarily as extensions of soil map units in the adjacent survey areas that extend to their natural limits within the park. The extent of these map units is generally greater in the adjacent areas, where they are documented and defined for use. In some instances, their extent in the park is quite minimal. The smallest of these is map unit 3439, which has only 5 acres within the park. Frequently, these soils do not have typifying pedons located on the park due to their small size. Documentation to support the map unit is found elsewhere, and its use in the park is decided based on air photo interpretation or observation. In such cases, the type location for the series is identified as occurring in the soil survey area where it is best represented.

The Keyole series (6,364 acres) is the most extensive soil series mapped in Great Basin National Park. Other series having relatively large extents include Bricone series (5,619 acres), Osditch series (3,894 acres), Badhap series (3,733 acres), Topeki series (3,379 acres), and the Canyoung series (2,546 acres). The extent of these six soil series accounts for 33% of the total park area. Twenty five of the remaining series have extents ranging from 508 to 2,326 acres. All other major components identified in the park each have fewer than 500 acres extent and cumulatively total about 3,086 acres or 4 percent of the area.

Some soil series have not been recognized in any area beyond the Great Basin National Park at this time. These soils include the Ceebee, Gaia, Goodski, Jumble, Lehmandow, Pirapeak, Snacreek, Strawbcrek, Timmercrek, Wayhigh and Wheelerpek series. The Ceebee, Goodski, Pirapeak, Snacreek and Strawbcrek soils are high-elevation, cryic soils formed in granitic parent materials. Gaia, Jumble and Timmercrek are also high-elevation, cryic soils that formed in till parent materials with largely quartzitic origin. Wheelerpek is an associated high-elevation, cryic soil that formed in residuum and colluvium from quartzite. Lehmandow series is a frigid, wet soil formed in alluvium from limestone and quartzite. The Wayhigh series is a high-elevation, cryic soil formed in residuum and colluvium from limestone and quartzite.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993) and in the "Field Book for Describing and Sampling Soils" (Schoeneberger and others, 2002). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 2006). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Amtoft series

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium through very high

Landform: Mountains

Parent material: Kind - Residuum; Source – Limestone, sandstone and shale

Slope range: 4 to 30 percent

Elevation: 6,200 to 6,360 feet

Mean annual precipitation: 10 to 12 inches

Mean annual air temperature: 45 to 50 degrees F.

Frost-free period: 100 to 120 days

Taxonomic class: Loamy-skeletal, carbonatic, mesic Lithic Xeric Haplocalcids

Typical pedon: Amtoft very gravelly loam, located in the soil survey of White Pine County, Nevada, East Part, rangeland. (Colors are dry soil unless otherwise noted.) The soil surface is partially covered with approximately 55 percent pebbles, 5 percent cobbles, and 1 percent stones.

A1—0 to 1 inch; light brownish gray (2.5Y 6/2) very gravelly loam, dark grayish brown (2.5Y 4/2) moist; weak fine platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular pores; 55 percent pebbles; violently effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

A2—1 to 6 inches; pale brown (10YR 6/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure and moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine interstitial pores; 55 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk—6 to 12 inches; pale brown (10YR 6/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine, and few medium roots; many very fine interstitial pores; 40 percent pebbles and 5 percent cobbles; violently effervescent; common distinct secondary calcium carbonate coats and few pendants on the bottom of rock fragments; moderately alkaline (pH 8.2); abrupt wavy boundary.

R—12 inches; hard fractured limestone.

Type location: White Pine County, Nevada; approximately 0.3 mile north of Henriod Homestead in Blue Mass Canyon; about 6,750 feet east and 1,500 feet north of the southwest corner of section 29, T.22 N., R.69 E.; USGS Tippet Canyon 7.5 minute topographic quadrangle; 39 degrees, 45 minutes, 2.7 seconds north latitude and 114 degrees, 12 minutes, 30 seconds west longitude; UTM Zone 11, 739178e, 4403821n, NAD 83.

Range in Characteristics:

Soil moisture: Usually dry, between a depth of 8 inches and bedrock. In 7 out of 10 years they are dry in all parts of the moisture control section 70 to 85 days during the summer and are continually moist 60 to 75 days during the winter and early spring. The moisture regime is aridic bordering on xeric.

Soil temperature: 47 to 59 degrees F.

Thickness of calcic horizon: 6 to 11 inches.

Depth to bedrock: 10 to 20 inches.

Control section:

Clay content—12 to 27.

Rock fragments—35 to 80 percent.

Calcium carbonate equivalent—More than 40 percent, including the calcium carbonate in the rock fragments of less than 20 mm size, between a depth of 10 inches and bedrock.

A horizons:

Hue—2.5Y, 10YR, or 7.5YR.

Value—5 to 7 dry, 3 to 5 moist. (The value of 5.5 or less dry and 3.5 or less moist occurs within 4 inches of the surface.)

Chroma—2 through 4.

Reaction—Slightly alkaline to strongly alkaline.

Calcium carbonate equivalent—20 to 70 percent.

Bk horizon:

Hue—2.5Y, 10YR or 7.5YR.

Value—5 to 8 dry, 4 to 7 moist.

Chroma—2 to 4.

Texture—Loam or fine sandy loam.

Rock fragments—35 to 80 percent that are flagstones, cobbles, or gravel.

Structure—Subangular blocky or is massive.

Consistence—Soft to slightly hard, very friable or friable, sticky to slightly sticky and slightly plastic or plastic.

Reaction—Moderately alkaline or strongly alkaline.

Calcium carbonate equivalent—40 to 80 percent.

Conductivity—0 to 4 mmhos/cm.

Badena series

(Fig. 54)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate.

Runoff: Medium or high

Landform: Outwash fans

Parent material: Kind - Alluvium; Source - Quartzite

Slope range: 4 to 30 percent

Elevation: 6,560 to 8,230 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 46 to 48 degrees F.



Figure 54—Profile of the Badena series.

Frost-free period: 90 to 110 days

Taxonomic class: Loamy-skeletal, mixed, superactive, mesic Aridic Argixerolls

Typical pedon: Badena extremely stony sandy loam, in map unit 3344, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with about 35 percent pebbles, 20 percent cobbles, and 5 percent stones.

A1—0 to 4 inches; grayish brown (10YR 5/2) extremely stony sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many fine interstitial and common very fine tubular pores; 15 percent pebbles, 20 percent cobbles, and 25 percent stones; neutral (pH 7.2), clear wavy boundary.

A2—4 to 12 inches; grayish brown (10YR 5/2) extremely stony sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine and few coarse roots; many very fine tubular and interstitial pores; 15 percent pebbles, 25 percent cobbles, and 25 percent stones; neutral (pH 7.2), clear irregular boundary.

Bt1—12 to 16 inches; brown (10YR 5/3) extremely stony clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, moderately sticky and slightly plastic; many very fine and common through coarse roots; many very fine tubular pores; common thin clay films bridging sand grains; 25 percent pebbles, 25 percent cobbles, and 20 percent stones; slightly alkaline (pH 7.4), clear irregular boundary.

Bt2—16 to 22 inches; brown (7.5YR 5/4) extremely stony clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; common very fine through coarse roots; common very fine tubular pores; common moderately thick clay films on faces of peds; 25 percent pebbles, 25 percent cobbles, and 20 percent stones; slightly alkaline (pH 7.6); clear irregular boundary.

Bt3—22 to 36 inches; brown (7.5YR 5/4) extremely stony clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common

very fine and fine and few medium roots; common very fine interstitial pores; common moderately thick clay films on faces of peds; 25 percent pebbles, 25 percent cobbles, and 20 percent stones; slightly alkaline (pH 7.4); gradual irregular boundary.

C—36 to 60 inches; pale brown (10YR 6/3) extremely stony loamy coarse sand, dark yellowish brown (10YR 4/4), moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; 30 percent pebbles, 20 percent cobbles, and 15 percent stones; slightly alkaline (pH 7.5).

Type location: White Pine County, Nevada; about ½ mile southeast of Park Headquarters in Great Basin National Park; USGS Lehman Caves 7.5 minute topographic quadrangle; 39 degrees, 01 minute, 19 seconds north latitude and 114 degrees, 12 minutes, 37 seconds west longitude, UTM zone 11, 741513e, 4322915n, NAD 83.

Range in Characteristics:

Soil moisture: Moist in winter and spring, dry in summer and fall except for 10 to 20 days cumulative between July and October due to convection storms; aridic moisture regime that borders on xeric.

Soil temperature: 47 to 50 degrees F.

Mollic epipedon thickness: 7 to 16 inches; includes the upper part of the Bt horizon in some pedons.

Depth to base of argillic horizon: 20 to 36 inches.

Depth to sandy-skeletal material: 20 to 36 inches.

Particle-size control section:

Clay content—20 to 35 percent;

Rock fragments—60 to 85 percent, dominantly cobbles and stones. Lithology of fragments are mainly quartzite.

A horizons:

Value—4 or 5 dry.

Chroma—2 or 3, dry or moist.

Reaction—Neutral or slightly alkaline

Organic matter content—1 or 2 percent.

Bt horizons:

Hue—10YR or 7.5YR

Value—4 through 6 dry; 3 or 4 moist; value of 3 moist occurs only in the Bt1 horizon.

Chroma—2 through 4, dry or moist.

Texture—Loam, sandy clay loam or clay loam; texture modifiers are: very cobbly, extremely cobbly or extremely stony.

Clay films—Few to common, faint to distinct.

Structure—Fine or medium subangular blocky.

Consistence—Slightly hard or hard dry, slightly sticky or moderately sticky and slightly plastic or moderately plastic.

C horizon:

Value—5 or 6 dry, 4 or 5 moist.

Chroma—3 through 6, dry or moist.

Texture—Loamy coarse sand, loamy sand, coarse sand, or sandy loam; texture modifiers are: extremely cobbly or extremely stony.

Rock fragments—60 to 85 percent, mainly cobbles and stones.

Consistence—Soft or slightly hard dry.

Badhap series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Runoff: High or very high

Landform: Mountains

Parent material: - Kind - Colluvium and residuum; Source - Quartzite

Slope range: 15 to 75 percent

Elevation: 6,820 to 10,500 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 30 to 60 days

Taxonomic class: Loamy-skeletal, mixed, superactive Pachic Haplocryolls

Typical pedon: Badhap very gravelly loam, located in the soil survey of White Pine County, Nevada, East Part, rangeland. (A reference pedon located in Great Basin National Park is in map unit 5420 at latitude 39.03203 degrees N and longitude 114.26781 degrees W. Colors are for dry soil unless otherwise noted.)

A1—0 to 3 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine, and few medium roots; common very fine and fine interstitial pores; 35 percent pebbles and 5 percent cobbles; slightly acid (pH 6.2); clear smooth boundary.

A2—3 to 10 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine, common medium, and few coarse roots; common very fine and fine interstitial pores; 35 percent pebbles and 5 percent cobbles; neutral (pH 6.6); clear wavy boundary.

A3—10 to 33 inches; brown (10YR 4/3) very cobbly loam, dark brown (10YR 3/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular and interstitial pores; 25 percent pebbles, 15 percent cobbles and 5 percent stones; neutral (pH 6.6); clear wavy boundary

AC—33 to 44 inches; brown (10YR 5/3) extremely cobbly loam, dark brown (10YR 3/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine interstitial and few fine tubular pores; 20 percent pebbles, 40 percent cobbles, and 5 percent stones; neutral (pH 6.6); abrupt wavy boundary.

C—44 to 60 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine and medium roots; common fine interstitial pores; 20 percent pebbles, 40 percent cobbles, and 5 percent stones; neutral (pH 6.8).

Type location: White Pine County, Nevada; approximately 1.8 miles south of O'Neal Peak; about 2,640 feet south and 575 feet east of the northwest corner of section 24, T.18 N., R.68 E.; USGS Third Butte East Quad 7.5 minute topographic quadrangle; latitude 39 degrees, 24 minutes, 40 seconds north and longitude 114 degrees, 16 minutes, 51 seconds west; UTM Zone 11, 734106e, 4365928n, NAD83.

Range in Characteristics:

Soil moisture: Usually dry, moist in winter and spring, and for brief periods in summer following convective storms; xeric soil moisture regime.

Mean annual soil temperature: 40 to 44 degrees F.

Mean summer soil temperature: 55 to 59 degrees F.

Mollic epipedon thickness: 25 to 50 inches.

Reaction: Slightly acid or neutral.

Control section:

Clay content—18 to 27 percent.

Rock fragments—Averages 35 to 55 percent, dominantly cobbles and pebbles; subhorizons range up to 70 percent in most pedons.

A horizons:

Hue—10YR or 7.5YR.

Value—2 through 5 dry, 2 or 3 moist.

Chroma—1 through 3, dry or moist; chroma of 1 is common only in A1 horizon.

Base saturation—50 to 75 percent in upper subhorizon.

C horizon:

Hue—10YR or 7.5YR.

Value—4 through 7 dry, 3 through 5 moist.

Chroma—2 through 6, dry or moist.

Texture—Predominantly loam, but includes fine sandy loam, sandy loam, silt loam or light clay loam in some pedons.

Bakerpeak series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Runoff: High

Landform: Mountains

Parent material: Kind — Colluvium; Source — Limestone and shale

Slope range: 30 to 75 percent

Elevation: 7,220 to 10,930 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Loamy-skeletal, carbonatic Xeric Calcicrypts

Typical pedon: Bakerpeak very gravelly loam, located in map unit 5270 in the soil survey of Snake Range Area, Nevada, about 2,030 feet west of the Great Basin National Park boundary. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 70 percent pebbles, 2 percent cobbles and 1 percent stones.

Oi—0 to 1 inch; slightly decomposed plant material consisting of fir and pine needles; abrupt smooth boundary

A1—1 to 2 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular and interstitial pores; 40 percent gravel and 10 percent cobbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

A2—2 to 5 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, moderately sticky and moderately plastic; common very fine and fine roots; common very fine tubular and interstitial pores; 45 percent gravel and 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk1—5 to 13 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, moderately sticky and moderately plastic; many very fine and fine and few medium and coarse roots; common very fine tubular and interstitial pores; 60 percent gravel and 10 percent cobbles; secondary calcium carbonate segregated as common

concretions on bottom of rock fragments; 38 percent calcium carbonate in less than 20 millimeter fraction; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk2—13 to 21 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine, common fine, and few medium and coarse roots; many very fine interstitial pores; 60 percent gravel and 10 percent cobbles; secondary calcium carbonate concretions as many pendants on bottom of rock fragments; 62 percent calcium carbonate in less than 20 millimeter fraction; violently effervescent; strongly alkaline (pH 8.6) clear wavy boundary.

Bk3—21 to 30 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine, and few medium and coarse roots; many very fine interstitial pores; 60 percent gravel and 10 percent cobbles; secondary calcium carbonate concretions as many pendants on bottom of rock fragments; 60 percent calcium carbonate in less than 20 millimeter fraction; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

Bk4—30 to 61 inches; light gray (10YR 7/2) extremely gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, and few medium roots in pockets; common very fine tubular and interstitial pores; 70 percent gravel and 5 percent cobbles; secondary calcium carbonate concretions as many pendants on bottom of rock fragments and finely disseminated in the matrix; 75 percent calcium carbonate in less than 20 millimeter fraction; violently effervescent; strongly alkaline (pH 8.6)

Type location: White Pine County, Nevada; about 0.75 mile south of Pole Canyon Creek and adjacent to the west boundary of Great Basin National Park; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 53 minutes, 34 seconds north latitude and 114 degrees, 20 minutes, 05 seconds west longitude; UTM Zone 11, 731157e, 4308249n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime.

Mean annual soil temperature: 39 to 44 degrees F.

Mean summer soil temperature: 45 to 47 degrees F.

Depth to calcic horizon: 10 to 20 inches.

Control section:

Clay content—Averages 12 to 18 percent.

Rock fragments—50 to 80 percent, mainly gravel and cobbles. Lithology of fragments is limestone.

A horizons:

Hue—10YR or 7.5YR.

Value—5 or 6 dry, 2 through 4 moist.

Chroma—2 through 4, dry or moist.

Reaction—Neutral through moderately alkaline.

Bk1 horizon:

Value—6 or 7 dry.

Chroma—3 or 4, dry or moist.

Clay content—18 to 25 percent.

Texture—Loam or sandy loam.

Rock fragments—50 to 80 percent, mainly as gravel.

Consistence—Soft or slightly hard, dry.

Reaction—Neutral through moderately alkaline.

Calcium carbonate equivalent—10 to 15 percent in the material less than 2 mm; 25 to 50 percent in the less than 20 mm fraction.

Bk2, Bk3, and Bk4 horizons:

Value—6 or 7 dry, 4 or 5 moist.

Chroma—2 or 3, dry or moist.

Texture—Loam or sandy loam.

Clay content—12 to 18 percent.

Rock fragments—50 to 80 percent, mainly as gravel.

Structure—Subangular blocky or massive.

Consistence—Soft or slightly hard dry.

Reaction—Moderately alkaline or strongly alkaline.

Calcium carbonate equivalent—25 to 35 percent in the material less than 2 mm; 60 to 75 percent in the less than 20 mm fraction.

Identifiable secondary carbonates—Common to many concretions on rock fragments, usually increasing with depth; Masses or filaments are not present in all pedons.

Basinpeak series

(Fig. 55)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Runoff: High

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Quartzite and granite

Slope range: 8 to 50 percent

Elevation: 7,090 to 10,370 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days



Figure 55—Profile of the Basinpeak series.

Taxonomic class: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Typical pedon: Basinpeak very gravelly loam, in an area of soil map unit 2430, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 30 percent pebbles, 5 percent cobbles, and 10 percent stones.

- A1—0 to 2 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular and interstitial pores, 35 percent pebbles, 5 percent cobbles, and 5 percent stones; slightly acid (pH 6.2); clear smooth boundary.
- A2—2 to 7 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; soft, very friable, moderately sticky and slightly plastic; common very fine through coarse roots; common very fine tubular and interstitial pores; 45 percent pebbles; neutral (pH 6.6); clear smooth boundary.
- A3—7 to 11 inches; brown (10YR 5/3) extremely gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, moderately sticky and slightly plastic; common very fine through coarse roots; common very fine tubular and interstitial pores; 50 percent pebbles and 10 percent cobbles; slightly acid (pH 6.4); clear wavy boundary.
- C1—11 to 23 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure, hard, friable, moderately sticky and slightly plastic; common very fine through coarse roots; common very fine tubular and interstitial pores; 60 percent pebbles and 10 percent cobbles; slightly acid (pH 6.5); clear wavy boundary.
- C2—23 to 60 inches; very pale brown (10YR 7/4) extremely gravelly coarse sandy loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few fine through coarse roots; common very fine interstitial and tubular pores; 55 percent pebbles and 10 percent cobbles; neutral (pH 6.6).

Type location: White Pine County, Nevada; About 1/3 mile south of Mill Creek in the Snake Range located in Great Basin National Park. USGS Windy Peak 7.5 minute topographic quadrangle; 39 degrees, 02 minutes, 02 seconds north latitude and 114 degrees, 15 minutes, 26 seconds west longitude; UTM zone 11, 0737408e, 4324111n, NAD 83.

Range in Characteristics:

Soil moisture: Much of the moisture that falls on the site is in the form of snow and is removed from these convex slopes by the wind; moist in spring, winter and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime.

Soil temperature: 40 to 45 degrees F.

Average summer soil temperature: 46 to 50 degrees F.

Mollic epipedon thickness: 10 to 16 inches.

Depth to extremely gravelly layers: 10 to 20 inches.

Depth to bedrock: 60 to 80 inches.

Control section:

Clay content—18 to 25 percent.

Rock fragments—Averages 65 to 85 percent dominantly pebbles.

A horizons:

Chroma—2 or 3, dry or moist.

Reaction—Slightly acid or neutral.

C horizons:

Hue—10YR or 2.5Y.

Value—6 or 7 dry, 4 through 6 moist.

Chroma—2 through 4, dry or moist.

Texture—Dominantly loam, subhorizons of sandy loam or coarse sandy loam are in the lower part in some pedons.

Clay content—18 to 25 percent.

Rock fragments—65 to 85 percent, dominantly pebbles.

Reaction—Slightly acid to slightly alkaline.

Other features—Some pedons with Bk horizons have few fine distinct secondary calcium carbonate concretions on bottom of rock fragments.

Bellenmine series

(Figs. 56, 57)

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderately slow

Runoff: High to very high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Quartzite

Slope range: 8 to 30 percent

Elevation: 7,090 to 8,500 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 39 to 43 degrees F.

Frost-free period: 40 to 70 days

Taxonomic class: Loamy-skeletal, mixed, superactive, frigid Lithic Argixerolls

Typical pedon: Bellenmine extremely gravelly sandy loam, in an area of soil map unit 2430, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 45 percent gravel, 5 percent cobbles, and 10 percent stones.

A1—0 to 2 inches; brown (10YR 5/3) extremely gravelly sandy loam, dark brown (10YR 3/3) moist; weak thick platy structure; soft, very friable, nonsticky and nonplastic; common very fine roots, many very fine and fine tubular and vesicular pores; 50 percent gravel, 5 percent cobbles, and 5 percent stones; slightly acid (pH 6.4); abrupt smooth boundary.

A2—2 to 5 inches; grayish brown (10YR 5/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; many very fine interstitial pores; 45 percent gravel, 5 percent cobbles, and 5 percent stones; neutral (pH 6.6); abrupt wavy boundary.

Bt1—5 to 9 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine and medium roots; many very fine tubular and interstitial pores; common faint clay films on faces of peds; 50 percent gravel; neutral (pH 7.3); clear wavy boundary

Bt2—9 to 13 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, moderately sticky and slightly plastic; many very fine, common fine and medium and few coarse roots; common very fine tubular pores; many prominent clay films on faces of peds; 50 percent gravel; neutral (pH 7.2); clear wavy boundary.

Bt3—13 to 18 inches; brown (7.5YR 5/4) extremely gravelly clay loam, dark brown (7.5YR 3/4) moist; strong medium subangular blocky structure; hard, very friable, moderately sticky and moderately plastic; common very fine through coarse roots; common very fine tubular pores; many prominent clay films on faces of peds; 60 percent gravel; slightly acid (pH 6.4); abrupt irregular boundary.

R—18 inches; hard fractured quartzite with soil and roots in fractures.



Bellenmine soils (Fig. 56) are shallow to hard quartzite bedrock. A pinyon-juniper forestland ecological site (Fig. 57) with low sagebrush in the understory is typical on Bellenmine soils.

Figure 56



Figure 57

Type location: White Pine County, Nevada; about 0.25 mile south of Mill Creek in Great Basin National Park in the Snake Range; about 1,400 feet south and 1,300 feet east of the northwest corner of section 5, T.13 N., R.69 E.; USGS Windy Peak 7.5 minute topographic quadrangle; 39 degrees, 1 minute, 57 seconds north latitude and 114 degrees, 15 minutes, 26 seconds west longitude; UTM zone 11, 737413e, 4323957n, NAD83.

Range in Characteristics:

Soil moisture: Usually dry; moist in winter and spring, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime bordering on Aridic.

Mean annual soil temperature: 42 to 45 degrees F.

Mollic epipedon thickness: 7 to 12 inches; includes the upper part of the argillic horizon.

Reaction: Slightly acid or neutral.

Depth to bedrock: 14 to 20 inches to a lithic contact.

Particle-size control section:

Clay content—27 to 35 percent.

Rock fragments—50 to 80 percent; mainly gravel. Lithology of fragments is quartzite.

A horizons:

Chroma—2 or 3, dry or moist.

Bt horizons:

Hue—10YR or 7.5YR.

Value—5 or 6 dry, 3 or 4 moist.

Chroma—3 or 4; 3 chroma only in Bt1.

Texture—Averages clay loam, loam may occur in Bt1 horizons.

Clay content—Averages 27 to 35 percent.

Structure—Subangular or angular blocky.

Consistence—Slightly hard or hard dry, very friable or friable moist, slightly sticky or moderately sticky and slightly plastic or moderately plastic wet.

Clay films—Common to many.

Berrycreek series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium or high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Quartzite

Slope range: 15 to 50 percent

Elevation: 7,810 to 10,500 feet

Mean annual precipitation: 24 to 37 inches

Mean annual air temperature: 35 to 39 degrees F.

Frost-free period: 30 to 50 days

Taxonomic class: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Typical pedon: Berrycreek very gravelly loam, in the soil survey of Humboldt National Forest, Nevada, South Part, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 35 percent gravel.

Oi and Oe—0 to 1 inch; slightly too moderately decomposed organic material consisting of aspen leaves and twigs and grass residues.

Oa—1 to 2 inches; highly decomposed organic material.

A1—2 to 8 inches; dark brown (10YR 3/3) very gravelly loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine, and common medium roots; common very fine and fine interstitial pores; very few distinct sand coats on the bottom of rock fragments and on faces of peds; 55 percent gravel; neutral (pH 6.7); clear smooth boundary.

A2—8 to 13 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through very coarse roots; common very fine and fine, and few medium and coarse tubular and interstitial pores; very few distinct sand coats on the bottom of rock fragments and on faces of peds; 45 percent gravel; neutral (pH 6.7); clear wavy boundary.

Bw1—13 to 22 inches; yellowish brown (10YR 5/4) extremely gravelly sandy clay loam, dark yellowish brown (10YR 3/4) moist; moderate coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine and medium, and few coarse roots; common very fine, fine, and medium, and few coarse tubular and interstitial pores; very few distinct sand coats on the bottom of rock fragments and on faces of peds; 65 percent gravel; neutral (pH 6.6); clear wavy boundary.

Bw2—22 to 60 inches; yellowish brown (10YR 5/4) extremely gravelly sandy clay loam, dark yellowish brown (10YR 3/4) moist; weak coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine, medium, coarse, and very coarse roots; few very fine, fine and medium interstitial pores; very few distinct sand coats on the bottom of rock fragments and on faces of peds; 65 percent gravel; slightly acid (pH 6.3).

Type location: White Pine County, Nevada; in the Schell Creek Range, Humboldt-Toiyabe National Forest, about 1.5 miles southwest of South Schell Peak; USGS South Schell Peak 7.5 minute topographic quadrangle; 39 degrees, 19 minutes, 15 seconds north latitude and 114 degrees, 36 minutes, 57 seconds west longitude; UTM zone 11, 0705518e, 4355077n; NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry July and early August. Moist intermittently in the upper part from summer convection storms primarily in late August and September. This soil accumulates additional moisture from wind-deposited snow. This soil is dry in all parts at least 45 consecutive days following the summer solstice; Typic xeric soil moisture regime.

Mean annual soil temperature: 37 to 41 degrees F.

Mean summer soil temperature: 44 to 47 degrees F.

Mean winter soil temperature: 32 to 36 degrees F.

Mollic epipedon thickness: 10 to 16 inches.

Reaction: Neutral or slightly acid.

Particle-size control section:

Clay content—Averages 18 to 27 percent.

Rock fragments—45 to 65 percent, mainly gravel or cobbles. Lithology of the fragments is quartzite.

O horizons:

Range from slightly decomposed to highly decomposed organic material derived from aspen leaves and twigs and grass residues.

A horizons:

Value—3 or 4 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Consistence—Soft or slightly hard, dry.

Concentrations—Faint or distinct sand and silt coats on the bottom of rock fragments and on faces of peds.

Bw horizons:

Value—5 through 7 dry, 3 or 4 moist.

Chroma—4 through 6, dry or moist.

Texture—Loam or sandy clay loam.

Clay content—18 to 27 percent.

Rock fragments—45 to 65 percent; with 30 to 65 percent gravel and 0 to 35 percent cobbles.

Structure—Weak to moderate, medium or coarse subangular blocky.

Consistence—Soft or slightly hard, dry.

Concentrations—Faint or distinct sand and silt coats on the bottom of rock fragments and faces of peds.

Bigwash series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Runoff: Low or medium

Landform: Drainageways

Parent material: Kind — Alluvium; Source — Limestone and minor amounts of quartzite

Slope range: 4 to 8 percent slopes

Elevation: 6,200 to 7,250 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 39 to 43 degrees F.

Frost-free period: 40 to 70 days

Taxonomic class: Coarse-loamy, mixed, superactive, frigid Cumulic Haploxerolls

Typical pedon: Bigwash loam, located in the soil survey of Snake Range Area, Nevada, about 3 miles south of the Great Basin National Park, rangeland. (Colors are for dry soil unless otherwise noted.)
The soil surface is covered with approximately 5 percent gravel.

A1—0 to 3 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure parting to weak fine subangular blocky; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; common very fine and fine, and few medium tubular and interstitial pores; 5 percent gravel; strongly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

A2—3 to 9 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate coarse subangular blocky structure parting to weak medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; common very fine and fine, and few medium tubular and interstitial pores; 5 percent gravel; strongly effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

AB1—9 to 15 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate coarse subangular blocky structure parting to moderate medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; common very fine, and few fine roots; common very fine and fine, and few medium tubular and interstitial pores; 5 percent gravel; violently effervescent; moderately alkaline (pH 8.1); clear smooth boundary.

AB2—15 to 30 inches; brown (10YR 4/3) loam, very dark brown (10YR 2/2) moist; moderate coarse subangular blocky structure parting to moderate medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine, and few fine and medium tubular and interstitial pores; 10 percent gravel; strongly alkaline (pH 8.7).

AB3—30 to 60 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate coarse subangular blocky structure parting to moderate medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine, fine, and medium tubular and interstitial pores; 10 percent gravel; strongly alkaline (pH 8.7).

Type location: White Pine County, Nevada; in the south Snake Range, about 1.5 miles south of Cedar Cabin Spring in Big Springs Wash, about 100 feet east of jeep trail; USGS Arch Canyon 7.5 minute topographic quadrangle; 38 degrees, 46 minutes, 28 seconds north latitude and 114 degrees, 14 minutes, 08 seconds west longitude; UTM zone 11, 0740163e, 4295377n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; This soil receives additional run-on moisture; Xeric soil moisture regime.

Mean annual soil temperature: 41 to 45 F.

Mollic epipedon thickness: 40 to 60 inches, with irregular organic carbon distribution.

Particle-size control section:

Clay content—Averages 12 to 18 percent.

Rock fragments—5 to 15 percent, mainly gravel. Lithology of the fragments is mainly limestone.

A horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Organic matter content—2 to 4 percent.

Reaction—Slightly alkaline to strongly alkaline.

AB horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Texture—Loam or sandy loam.

Clay content—12 to 18 percent.

Rock fragments—5 to 15 percent, mainly as gravel.

Structure—Weak to moderate, medium or coarse subangular blocky.

Consistence—Soft or slightly hard, dry.

Reaction—Moderately alkaline or strongly alkaline.

Calcium carbonate equivalent—0 to 5 percent.

Other features—Some pedons contain thin subhorizons with 35 to 45 percent rock fragments but when averaged it is less than 15 percent.

Borvant series

Depth class: Shallow to a petrocalcic horizon

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium through very high

Landform: Fan remnants

Parent material: Kind - Alluvium and colluvium; Source - Limestone

Slope range: 4 to 30 percent

Elevation: 6,200 to 7,610 feet

Mean annual precipitation: 12 to 16 inches

Mean annual air temperature: 45 to 48 degrees F.

Frost-free period: 90 to 110 days

Taxonomic class: Loamy-skeletal, carbonatic, mesic, shallow Petrocalcic Palexerolls

Typical pedon: Borvant extremely gravelly loam, in soil map unit 1900, rangeland. (Colors are for dry soil unless otherwise noted.)

A1—0 to 4 inches; grayish brown (10YR 5/2) extremely gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine tubular and interstitial pores; 65 percent pebbles and 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

A2—4 to 8 inches; brown (10YR 5/3) extremely gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine, and common medium and coarse roots; common very fine and fine tubular and interstitial pores; 65 percent pebbles and 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk—8 to 14 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, medium and coarse roots; common very fine and fine tubular and interstitial pores; 15 percent pebbles, 50 percent pebble-sized fragments of strongly cemented petrocalcic material; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

Bkm—14 to 25 inches; white (10YR 8/1) hardpan strongly cemented by secondary calcium carbonate with 2 mm thick indurated laminar cap at upper boundary, light gray (10YR 7/2) moist; massive; extremely hard and extremely firm; violently effervescent; gradual wavy boundary.

2Ck—25 to 60 inches; light gray (10YR 7/2) extremely gravelly loamy sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 65 percent pebbles and 5 percent cobbles; common distinct secondary calcium carbonate pendants around rock fragments and secondary calcium carbonate disseminated throughout matrix; violently effervescent; moderately alkaline (pH 8.4).

Type location: White Pine County, Nevada; about 0.5 mile south of Baker Creek in Great Basin National Park; about 1,800 feet south and 200 feet west of the northeast corner of section 23, T.13 N., R.69 E.; USGS Kiou Spring 7.5 minute topographic quadrangle; 38 degrees, 59 minutes, 15.8 seconds north latitude and 114 degrees, 11 minutes, 20 seconds west longitude; UTM Zone 11, 743482e, 4319174n, NAD83.

Range in Characteristics:

Soil moisture: Usually dry, but moist in winter and spring, dry in summer and fall except for 10 to 20 days cumulative between July and October due to convection storms.

Soil temperature: 47 to 54 degrees F.

Depth to petrocalcic horizon: 10 to 20 inches.

Mollic epipedon thickness: 7 to 14 inches.

Calcium carbonate equivalent: 40 to 60 percent, including the less than 20 millimeter fraction.

Particle-size control section:

Clay content—10 to 18 percent.

Rock fragments—15 to 60 percent gravel. Cobbles and pan fragments range from 10 to 80 percent

A horizons:

Hue—10YR or 7.5YR

Value—4 or 5 dry, 2 or 3 moist.

Chroma—1 through 3, dry or moist.

Reaction—Slightly alkaline to strongly alkaline

Calcium carbonate equivalent—15 to 40 percent

Bk horizon:

Hue—10YR to 5YR

Value—5 through 8 dry, 4 through 7 moist.

Chroma—2 through 4.

Texture—Loam or fine sandy loam.

Chroma—2 through 4, dry or moist.

Structure—Subangular blocky or massive.

Calcium carbonate equivalent—40 to 60 percent.

Reaction—Moderately alkaline or strongly alkaline.

Bkm horizon:

Hue—10YR or 7.5YR

Value—7 or 8 dry.

Chroma—1 to 3, dry or moist.

2Ck horizon:

Value—7 or 8 dry.

Rock fragments—60 to 70 percent, mainly as gravel.

Reaction—Moderately alkaline to very strongly alkaline

Bricone series

(Figs. 58, 59)

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderate

Runoff: High

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Limestone and dolomite

Slope range: 15 to 75 percent

Elevation: 7,680 to 11,680 feet

Mean annual precipitation: 24 to 37 inches

Mean annual air temperature: 35 to 39 degrees F.

Frost-free period: 30 to 50 days



Figure 58—Profile of the Bricone series.



Figure 59—The shallow Bricone soils are on limestone-dolomite mountains. They commonly support bristlecone pine and limber pine forestland.

Taxonomic class: Loamy-skeletal, carbonatic Lithic Cryorthents

Typical pedon: Bricone very gravelly fine sandy loam, in an area of soil map unit 5250, forestland.
(Colors are for dry soils unless otherwise noted.) The soil surface is covered with approximately 60 percent pebbles, 10 percent cobbles, and 5 percent stones

A—0 to 3 inches; grayish brown (10YR 5/2) very gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine tubular and interstitial pores; 40 percent pebbles, 10 percent cobbles and 5 percent stones; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

Bw—3 to 10 inches; light brownish gray (10YR 6/2) extremely gravelly fine sandy loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine, common medium, and few coarse roots; common very fine tubular and interstitial pores; 70 percent pebbles and 5 percent cobbles; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary

Bk—10 to 13 inches; light brownish gray (10YR 6/2) extremely gravelly fine sandy loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine, common medium and few coarse roots; common very fine tubular and interstitial pores; 70 percent pebbles and 5 percent cobbles; 5 percent visible secondary calcium carbonate concretions on bottom of rock fragments; slightly effervescent; moderately alkaline (pH 7.9); abrupt irregular boundary.

R—13 inches; very rigid, indurated, fractured limestone bedrock.

Type location: White Pine County Nevada; about 2,000 feet southeast of Granite Peak in the Snake Range in Great Basin National Park; USGS Minerva Canyon 7.5 minute topographic quadrangle; 38 degrees, 50 minutes, 28 seconds north latitude and 114 degrees, 15 minutes, 21 seconds west longitude; UTM zone 11, 738173e, 4302718n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist; moist in winter, spring and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; much of the moisture that falls on the site is in the form of snow and is removed from these convex slopes by the wind; Xeric soil moisture regime.

Soil temperature: 38 to 41 degrees F.

Mean summer soil temperature: 47 to 50 degrees F.

Depth to base of the Bw horizon: 6 to 10 inches.

Depth to bedrock: 10 to 20 inches.

Particle-size control section:

Clay content—Averages 12 to 18 percent.

Rock fragments—50 to 80 percent, dominantly limestone pebbles.

A horizon:

Value—5 or 6 dry, dominantly 4 through 6 moist; value of 3 moist may occur in A1 horizon less than 10 cm thick.

Chroma—2 or 3 dry, 2 through 4 moist.

Effervescence—Slightly effervescent to strongly effervescent.

Reaction—Slightly alkaline or moderately alkaline.

Bw and Bk horizons:

Value—6 or 7 dry, 4 or 5 moist.

Chroma—2 or 3, dry or moist.

Texture—Fine sandy loam, loam or sandy loam.

Clay content—12 to 18 percent.

Rock fragments—50 to 80 percent.

Structure—Subangular blocky, or massive.

Reaction—Slightly alkaline or moderately alkaline.

Effervescence—Slightly effervescent to violently effervescent.

Calcium carbonate—40 to 60 percent, for the less than 20 mm fraction; 10 to 15 for the fine earth fraction.

Other features—Bk is too thin or lacks enough visible secondary calcium carbonate to meet calcic criteria.

Brokit series

(Figs. 60, 61)

Depth class: Very deep

Drainage class: Somewhat poorly or moderately well drained

Permeability: Moderate

Runoff: Medium

Landform: Stream terraces and ground moraines

Parent material: Kind — Alluvium and glacial outwash; Source — Quartzite with minor amounts of limestone, granite and dolomite

Slope range: 4 to 15 percent

Elevation: 6,820 to 9,190 feet

Mean annual precipitation: 18 to 28 inches



Figure 60

Brokit soils (Fig. 60) are very deep with a high volume of quartzite fragments. Seasonal saturation within a meter of the soil surface is favorable to an aspen forestland ecological site (Fig. 61) with smaller amounts of white fir common in the site.



Figure 61

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Loamy-skeletal over sandy or sandy-skeletal, mixed, superactive Aquic Cumulic Haplocryolls

Typical pedon: Brokit very stony highly organic loam, in an area of soil map unit 5430, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 35 percent pebbles, 5 percent cobbles, and 5 percent stones.

A1—0 to 4 inches; dark gray (10YR 4/1) very stony highly organic loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine, and few medium and coarse roots; common very fine tubular and interstitial pores; 15 percent pebbles, 15 percent cobbles, and 25 percent stones; slightly acid (pH 6.4); clear wavy boundary.

A2—4 to 16 inches; dark gray (10YR 4/1) very stony loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine and medium, and few coarse roots; common very fine tubular and interstitial pores; 10 percent pebbles, 15 percent cobbles, and 30 percent stones; slightly acid (pH 6.2); abrupt wavy boundary.

2C1—16 to 30 inches; light brownish gray (10YR 6/2) extremely cobbly loamy coarse sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine, common fine and medium, and few coarse roots; common very fine and fine interstitial pores; few medium distinct brown (7.5YR 5/4) masses of iron accumulation; 30 percent pebbles, 35 percent cobbles, and 15 percent stones; neutral (pH 6.6); clear wavy boundary.

2C2—30 to 60 inches; light brownish gray (10YR 6/2) extremely cobbly loamy coarse sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine and fine interstitial pores; common medium distinct brown (7.5YR 5/4) masses of iron accumulation; 30 percent pebbles, 35 percent cobbles, and 10 percent stones; neutral (pH 6.8).

Type location: White Pine County, Nevada; in Great Basin National Park about 1,000 feet southwest of the Baker Creek Trailhead and 300 feet south of Baker Creek; USGS Kious Spring 7.5 minute topographic quadrangle; 38 degrees, 58 minutes, 33 seconds north latitude and 114 degrees, 14 minutes, 41 seconds west longitude; UTM Zone 11 738685e, 4317706n, NAD 83.

Range in Characteristics:

Soil moisture: Usually moist; moist in winter, spring and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; ground water has an upper boundary between 30 to 40 inches during spring months in normal years; Xeric soil moisture regime.

Mean annual soil temperature: 39 to 45 degrees F.

Mean summer soil temperature: 47 to 50 degrees F.

Mollic epipedon thickness: 16 to 22 inches.

Depth to strongly contrasting sandy-skeletal material: 16 to 22 inches.

Reaction: Slightly acid or neutral.

Particle-size control section:

Clay content—12 to 20 percent in the upper part and 3 to 10 percent in the strongly contrasting lower part.

Rock fragments—35 to 60 percent in the upper part and 65 to 90 percent in the strongly contrasting lower part, mainly cobbles and stones. Lithology of fragments is mainly quartzite.

A horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—1 or 2, dry or moist.
 Clay content—12 to 20 percent.
 Rock fragments—35 to 60 percent.
 Organic matter content—2 to 4 percent.

2C horizons:

Value—6 or 7 dry, 4 or 5 moist.
 Chroma—2 or 3, dry or moist.
 Texture—Loamy coarse sand or coarse sand.
 Clay content—3 to 10 percent.
 Rock fragments—65 to 90 percent, dominantly cobbles and stones.
 Redoximorphic features—Redoximorphic concentrations occurs as few or common masses of iron accumulation.

Canyonfork series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Runoff: Low or medium
Landform: Alluvial fans
Parent material: Kind — Alluvium; Source — fanglomerate, limestone, dolomite and quartzite
Slope range: 4 to 15 percent
Elevation: 6,460 to 7,580 feet
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 39 to 43 degrees F.
Frost-free period: 40 to 70 days

Taxonomic class: Loamy-skeletal, carbonatic, frigid Typic Calcixerolls

Typical pedon: Canyonfork very gravelly fine sandy loam, located in the soil survey of Snake Range Area, Nevada, about 4.4 miles south of Great Basin National Park, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with approximately 70 percent gravel and 10 percent cobbles.

A—0 to 3 inches; dark grayish brown (10YR 4/2) very gravelly fine sandy loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine, and few medium roots; many very fine, common fine, and few medium tubular and interstitial pores; 23 percent calcium carbonate equivalent; 40 percent gravel; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

ABk—3 to 8 inches; brown (10YR 5/3) very gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure parting to weak fine subangular blocky; soft, very friable, nonsticky and nonplastic; common very fine and fine, and few medium roots; common very fine and fine, and few medium tubular and interstitial pores; common faint (3 percent) secondary calcium carbonate concretions on bottom of rock fragments; 21 percent calcium carbonate equivalent; 45 percent gravel and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

Bk1—8 to 15 inches; brown (10YR 5/3) extremely gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine, and few medium roots; common very fine and fine, and few medium tubular and interstitial pores; few faint (1 percent) secondary calcium carbonate concretions around rock fragments and common distinct (8 percent) secondary calcium carbonate concretions on bottom

of rock fragments; 32 percent calcium carbonate equivalent; 60 percent gravel and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bk2—15 to 24 inches; pale brown (10YR 6/3) extremely gravelly fine sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and few fine and medium roots; common very fine and few fine tubular and interstitial pores; common faint (2 percent) secondary calcium carbonate concretions around rock fragments and common prominent (15 percent) secondary calcium carbonate concretions on bottom of rock fragments; 30 percent calcium carbonate equivalent; 60 percent gravel and 10 percent cobbles; violently effervescent; moderately alkaline (pH 8.3).

2Bk3—24 to 60 inches; dark grayish brown (10YR 4/2) extremely gravelly loam, very dark brown (10YR 2/2) moist; moderate coarse subangular blocky structure parting to moderate medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine, and few fine tubular and interstitial pores; common faint (2 percent) secondary calcium carbonate concretions around rock fragments and common prominent (15 percent) secondary calcium carbonate concretions on bottom of rock fragments; 34 percent calcium carbonate equivalent; 70 percent gravel; violently effervescent; moderately alkaline (pH 8.4).

Type location: White Pine County, Nevada; in the south Snake Range, about 3 miles south of Cedar Cabin Spring and 1 mile south of Decathon Canyon, in Big Springs Wash, about 75 feet east of jeep trail; USGS Arch Canyon 7.5 minute topographic quadrangle; 38 degrees, 45 minutes, 15 seconds north latitude and 114 degrees, 14 minutes, 54 seconds west longitude; UTM zone 11, 0739109e, 4293109n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; this soil receives additional run-on moisture; Xeric soil moisture regime bordering on Aridic.

Mean annual soil temperature: 41 to 45 degrees F.

Mollic epipedon thickness: 10 to 20 inches.

Depth to calcic horizon: 7 to 12 inches.

Thickness of the calcic horizon: 40 to 53 inches.

Particle-size control section:

Clay content—Averages 12 to 18 percent.

Rock fragments—50 to 75 percent, mainly gravel. Lithology of the fragments is mainly limestone.

A and Abk horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Consistence—Soft or slightly hard, dry.

Organic matter content—1 to 3 percent.

Structure—Granular or subangular blocky.

Calcium carbonate equivalent—15 to 25 percent.

Effervescence—Slightly effervescent to violently effervescent.

Reaction—Neutral to moderately alkaline.

Bk and 2Bk horizons:

Value—4 through 6 dry, 2 through 4 moist.

Chroma—2 or 3, dry.

Texture—Loam, fine sandy loam, or sandy loam.

Clay content—12 to 18 percent.

Rock fragments—50 to 75 percent, mainly as gravel.

Structure—Weak to moderate, fine to coarse subangular blocky.

Consistence—Soft or slightly hard, dry, nonsticky or slightly plastic, moist.

Calcium carbonate equivalent: 30 to 40 percent in the less than 2 mm fraction; 40 to 60 in the less than 20 mm fraction.

Effervescence—Strongly effervescent to violently effervescent.

Secondary calcium carbonates—Common to many (5 to 25 percent) secondary calcium carbonate concretions on the bottom of rock fragments.

Reaction—Slightly alkaline to strongly alkaline.

Canyoung series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium to High

Landform: Mountains

Parent material: Kind — Colluvium; Source — Limestone, dolomite and calcareous shale

Slope range: 4 to 75 percent

Elevation: 6,760 to 10,930 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Loamy-skeletal, carbonatic Xeric Calcicryolls

Typical pedon: Canyoun extremely gravelly loam, located in map unit 5270 in the soil survey of Snake Range Area, Nevada, about 2,440 feet west of Great Basin National Park, forestland. (A reference pedon in Great Basin National Park is in map unit 5270 at latitude 38.8647 degrees N and longitude 114.2216 degrees W. Colors are for dry soil unless otherwise noted.) The soil surface is covered by approximately 60 percent pebbles, 5 percent cobbles, and 1 percent stones.

A—0 to 4 inches; dark grayish brown (10YR 4/2) extremely gravelly loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; common very fine tubular and interstitial pores; 55 percent pebbles and 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

Abk—4 to 12 inches; brown (10YR 5/3) extremely gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine and medium roots; common very fine tubular and interstitial pores; 5 percent, 1 to 2 mm thick secondary calcium carbonate concretions on the bottom of rock fragments; 55 percent pebbles and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk1—12 to 27 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine, fine, medium and coarse roots; many very fine interstitial pores; 15 percent secondary calcium carbonate pendants on the bottom of rock fragments; 65 percent pebbles and 10 percent cobbles; violently effervescent; moderately alkaline (pH 8.3); clear wavy boundary.

Bk2—27 to 60 inches; very pale brown (10YR 7/3) extremely gravelly loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, few medium and coarse roots; many very fine interstitial pores; 40 percent secondary calcium carbonate as pendants on the bottom of rock fragments and finely disseminated throughout the matrix; 70 percent pebbles and 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.4).

Type location: White Pine County, Nevada; about 0.25 mile south of Pole Canyon Creek and about 0.25 mile north of Mount Wheeler Mine, adjacent to the west boundary of Great Basin National Park, The profile description is from a road cut; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38

degrees, 53 minutes, 54 seconds north latitude and 114 degrees, 20 minutes, 10 seconds west longitude; UTM Zone 11, 731019e, 4308862n, NAD 83.

Range in Characteristics:

Soil moisture: Usually moist in the moisture control section during winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime.

Mean annual soil temperature: 39 to 45 degrees F.

Mean summer soil temperature: 47 to 50 degrees F.

Mollic epipedon thickness: 8 to 15 inches.

Depth to calcic horizon: 8 to 15 inches.

Reaction: Slightly alkaline or moderately alkaline.

Particle-size control section:

Clay content—12 to 18 percent.

Rock fragments—Averages 65 to 90 percent, dominantly pebbles. Lithology of fragments is limestone and calcareous shale.

A and Abk horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Organic matter content—1 to 3 percent.

Effervescence—Slightly effervescent to strongly effervescent.

Calcium carbonate content—Greater than 40 percent in the less than 20 mm size fraction; 5 to 10 percent calcium carbonate equivalent in the less than 2 mm fraction. Secondary calcium carbonate forms thin concretions on the bottom of rock fragments in some profiles.

Bk horizons:

Value—5 through 7 dry, 4 or 5 moist.

Chroma—2 or 3, dry or moist.

Rock fragments—65 to 90 percent, dominantly pebbles.

Structure—Subangular blocky or massive.

Identifiable secondary calcium carbonate—Common to many (15 to 40 percent) pendants on rock fragments and/or concretions on peds.

Calcium carbonate content—Greater than 40 percent in the less than 20 mm size fraction; 15 to 25 percent calcium carbonate equivalent in the less than 2 mm fraction.

Cedarcabin series

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Moderately

Runoff: Medium to high

Landform: Fan remnants

Parent material: Kind — Colluvium and residuum; Source — Fanglomerate

Slope range: 15 to 50 percent

Elevation: 6,460 to 7,580 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 39 to 43 degrees F.

Frost-free period: 40 to 70 days

Taxonomic class: Loamy-skeletal, carbonatic, frigid Typic Calcixerolls

Typical pedon: Cedarabin gravelly loam, located in the soil survey of Snake Range Area, Nevada, about 4.3 miles south of Great Basin National Park, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with approximately 40 percent gravel, 10 percent cobbles, and 5 percent stones.

A—0 to 3 inches; brown (10YR 4/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine, fine, and medium tubular and interstitial pores; 22 percent calcium carbonate equivalent; finely disseminated calcium carbonate; 20 percent gravel and 5 percent cobbles; strongly effervescent; slightly alkaline (pH 7.4); clear smooth boundary.

Abk—3 to 9 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; strong fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine, many fine, and few medium roots; common very fine, and few fine and medium tubular and interstitial pores; finely disseminated calcium carbonate; common distinct (3 percent) secondary calcium carbonate concretions on bottom of rock fragments; 25 percent calcium carbonate equivalent; 30 percent gravel and 10 percent cobbles; strongly effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

Bk1—9 to 15 inches; yellowish brown (10YR 5/4) very gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and coarse, and common fine and medium roots; common very fine and few fine and medium tubular and interstitial pores; finely disseminated calcium carbonate; common distinct (3 percent) secondary calcium carbonate concretions around rock fragments and common distinct (10 percent) secondary calcium carbonate concretions on bottom of rock fragments forming 1 mm pendants; 42 percent calcium carbonate equivalent; 45 percent gravel and 10 percent cobbles; violently effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

Bk2—15 to 23 inches; very pale brown (10YR 7/3) extremely gravelly sandy clay loam, brown (10YR 5/3) moist; strong fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; common very fine, and few fine and medium tubular and interstitial pores; finely disseminated calcium carbonate; many prominent (25 percent) secondary calcium carbonate concretions around rock fragments and common prominent (10 percent) secondary calcium carbonate concretions on bottom of rock fragments forming 2 mm pendants; 48 percent calcium carbonate equivalent; 50 percent gravel and 15 percent cobbles; violently effervescent; strongly alkaline (pH 8.5).

Bk3—23 to 31 inches; very pale brown (10YR 7/3) extremely gravelly sandy clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine, and few fine and medium tubular and interstitial pores; finely disseminated calcium carbonate; many prominent (30 percent) secondary calcium carbonate concretions around rock fragments and on bottom of rock fragments forming 2 mm pendants; 53 percent calcium carbonate equivalent; 60 percent gravel and 15 percent cobbles; violently effervescent; strongly alkaline (pH 8.5).

Cr—31 to 35 inches; very pale brown (10YR 8/2) moderately cemented weathered fanglomerate, very pale brown (10YR 7/3) moist; many prominent (40 percent) calcium carbonate concretions around rock fragments; 58 percent calcium carbonate equivalent; 55 percent gravel and 25 percent cobbles; violently effervescent; strongly alkaline (pH 8.7).

R—35 inches; very pale brown (10YR 8/2) indurated fanglomerate, very pale brown (10YR 7/3) moist.

Type location: White Pine County, Nevada; in the south Snake Range, BLM Ely District, about 600 feet west of jeep trail in Big Spring Wash about 1 mile south of Decathlon Canyon; USGS Arch Canyon 7.5 minute topographic quadrangle; 38 degrees, 45 minutes, 19.0 seconds north latitude and 114 degrees, 15 minutes, 0 seconds west longitude; UTM zone 11, 0738955e, 4293222n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10

to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime bordering on Aridic.

Mean annual soil temperature: 41 to 44 degrees F.

Mollic epipedon thickness: 7 to 12 inches.

Depth to calcic horizon: 8 to 12 inches.

Calcic horizon thickness: 8 to 28 inches.

Depth to bedrock: 20 to 36 inches to a paralithic contact. Indurated bedrock at 58 to 100 cm's below soil surface.

Particle-size control section:

Clay content—Averages 18 to 27 percent.

Rock fragments—35 to 75 percent mainly gravel. Lithology of the fragments is mainly limestone.

A and Abk horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Organic matter content—2 to 3 percent.

Structure—Granular or subangular blocky.

Calcium carbonate equivalent—20 to 30 percent.

Effervescence—Strongly effervescent or violently effervescent.

Reaction—Slightly alkaline to strongly alkaline.

Bk horizons:

Value—5 through 7 dry, 4 or 5 moist.

Chroma—2 through 4, dry and 3 or 4 moist.

Texture—Loam, fine sandy loam, or sandy clay loam.

Clay content—18 to 27 percent.

Rock fragments—35 to 75 percent, mainly as gravel.

Structure—Weak to moderate, fine or medium subangular blocky.

Calcium carbonate equivalent—40 to 60 percent.

Secondary calcium carbonate—Common to many (3 to 30 percent) secondary calcium carbonate concretions around and on the bottom of rock fragments, increasing with depth.

Reaction—Moderately alkaline or strongly alkaline.

Cr layer:

Chroma—2 or 3, dry or moist.

Cementation—Weakly cemented to moderately cemented.

Ceebee series

(Figs. 62, 63)

Depth class: Very deep

Drainage class: Somewhat excessively drained

Permeability: Moderately rapid

Runoff: Medium

Landform: Mountains

Parent material: Kind — Colluvium; Source — Granite

Slope range: 30 to 75 percent slopes

Elevation: 7,840 to 11,520 feet

Mean annual precipitation: 24 to 37 inches

Mean annual air temperature: 35 to 39 degrees F.

Frost-free period: 30 to 50 days

Taxonomic class: Sandy-skeletal, mixed Lamellic Haplocryalfs



Figure 62

Ceebee soils (Fig. 62) are very deep soils with a high volume of granitic rocks. They are somewhat excessively drained. They support a forestland ecological site dominated by Englemann's spruce and limber pine. (Fig. 63)

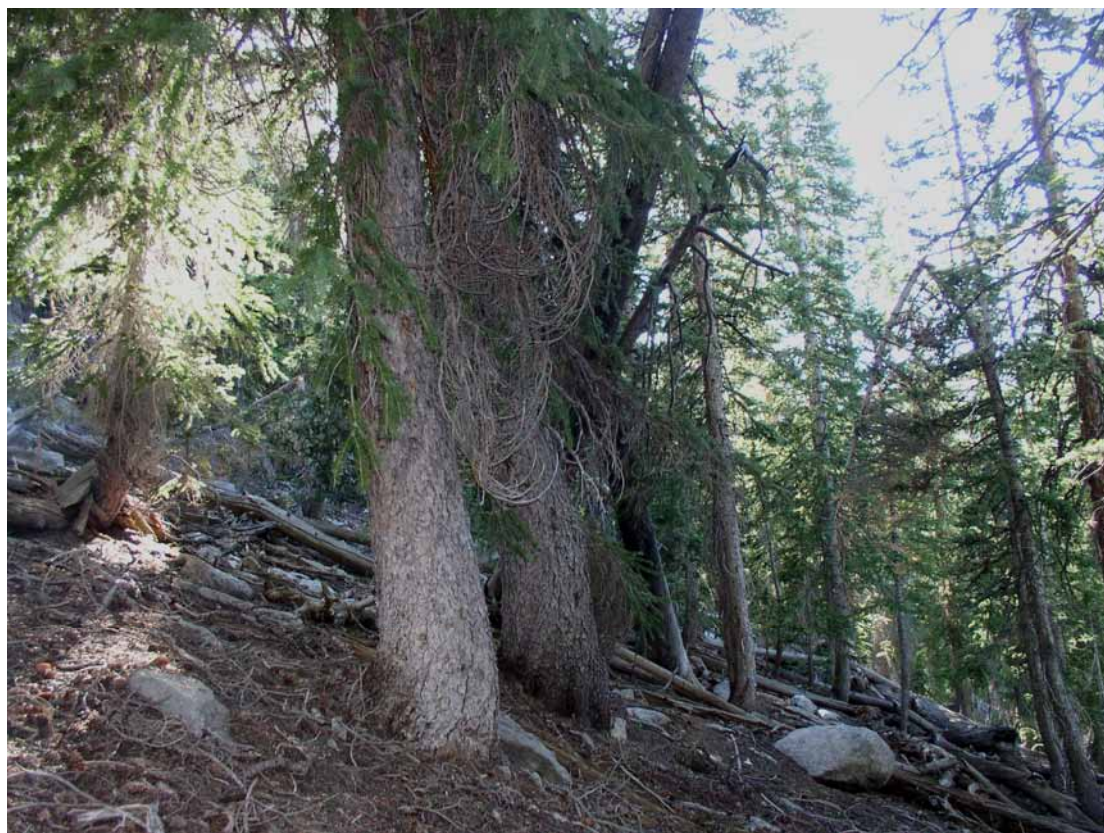


Figure 63

Typical pedon: Ceebee very stony loam, in an area of soil map unit 5381, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 20 percent pebbles, 15 percent cobbles, 10 percent stones, and 5 percent boulders.

Oi—0 to 1 inch; slightly decomposed plant material composed of conifer needle duff; abrupt smooth boundary.

Oe—1 to 2 inches; moderately decomposed pine needles, abrupt smooth boundary.

A—2 to 5 inches; dark grayish brown (10YR 4/2) very stony loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine tubular and interstitial pores; 20 percent pebbles, 5 percent cobbles, 10 percent stones and 5 percent boulders; strongly acid (pH 5.4); clear smooth boundary.

A/E—5 to 10 inches; mixed light brownish gray (10YR 6/2) and light gray (10YR 7/2) gravelly loam, dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through coarse roots; common very fine tubular and interstitial pores; few fine distinct brown (7.5YR 4/4) moist masses of iron accumulation; 20 percent pebbles and 10 percent cobbles; strongly acid (pH 5.4); clear smooth boundary.

E—10 to 24 inches; light gray (10YR 7/2) extremely stony loamy coarse sand, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine through coarse roots; many very fine interstitial pores; 50 percent pebbles, 10 percent cobbles, and 20 percent stones; very strongly acid (pH 5.0); gradual wavy boundary.

E and Bt—24 to 62 inches; 70 percent very pale brown (10YR 7/3) extremely gravelly loamy coarse sand, brown (10YR 5/3) moist (E part), with 30 percent light yellowish brown (10YR 6/4) 5 to 20 mm thick lamellae of extremely gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist (Bt part); massive; soft, very friable, nonsticky and nonplastic; few very fine through coarse roots; common very fine tubular and interstitial pores; common distinct clay films on sand grains and lining pores within lamellae; 40 percent pebbles, 15 percent cobbles, and 5 percent stones; very strongly acid (pH 5.0)

Type location: White Pine County, Nevada; in Great Basin National Park about 1.3 miles east of Johnson Lake and 0.75 mile north of Dead Lake; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 56 minutes, 48 seconds north latitude and 114 degrees, 16 minutes, 25 seconds west longitude; UTM Zone 11 736279e, 4314387n, NAD 83.

Range in Characteristics:

Soil moisture: Usually moist in the moisture control section in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; snow covered from November through April, surface is nearly saturated for less than 20 days during snowmelt in April or May; Xeric soil moisture regime.

Mean annual soil temperature: 33 to 39 degrees F.

Mean summer soil temperature: 44 to 47 degrees F.

Ochric epipedon thickness: 18 to 26 inches, includes the Oi, Oe, A, A/E and E horizons.

Depth to top of albic horizon: 2 to 4 inches measured from the mineral soil surface at the top of the A horizon.

Depth to base of argillic horizon: More than 60 inches measured from the mineral soil surface at the top of the A horizon.

Particle-size control section:

Clay content—Averages 4 to 12 percent.

Rock fragments—50 to 80 percent with 2 to 5 mm diameter pebbles dominating the less than 3 inch fraction. Lithology of fragments is granitic rocks.

E horizon:

Chroma—2 or 3, dry or moist.

Clay content—3 to 10 percent.

Rock fragments—50 to 80 percent, mainly fine (2 to 5 mm diameter) gravel dominating the less than 3 inch fraction.

Reaction—Very strongly acid to moderately acid.

E and Bt horizon:

Chroma—3 or 4, dry or moist.

Texture—The matrix is 50 to 80 percent loamy coarse sand (E part) with 20 to 50 percent coarse sandy loam lamellae (Bt part); averages very cobbly loamy coarse sand if mixed.

Clay content—Averages 6 to 12 percent.

Rock fragments—50 to 80 percent, with 2 to 5 mm diameter gravel dominating the less than 3 inch fraction.

Reaction—Very strongly acid to moderately acid.

Base saturation—35 to 60 percent.

Lamellae—The argillic horizon consists of 5 to 20 mm thick lamellae which have a cumulative thickness of more than 6 inches. Some pedons have few lamellae which are sandy clay loam texture.

Checkett series

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderately slow

Runoff: Medium to very high

Landform: Mountains

Parent material: Kind - Residuum and colluvium; Source - quartzite rocks

Slope range: 15 to 50 percent

Elevation: 6,360 to 7,640 feet

Mean annual precipitation: 8 to 12 inches

Mean annual air temperature: 45 to 52 degrees F.

Frost-free period: 90 to 110 days

Taxonomic class: Loamy-skeletal, mixed, superactive, mesic Lithic Xeric Haplargids

Typical pedon: Checkett extremely gravelly loam, located in the soil survey of White Pine County, Nevada, East Part, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with approximately 45 percent pebbles, 20 percent cobbles, and 5 percent stones.

A—0 to 3 inches; pale brown (10YR 6/3) extremely gravelly loam, dark brown (10YR 3/3) moist; moderate very fine and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine and fine vesicular pores; 45 percent pebbles, 20 percent cobbles, and 5 percent stones; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

BA—3 to 10 inches; pale brown (10YR 6/3) extremely gravelly clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine tubular pores; 50 percent pebbles and 15 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

Bt—10 to 17 inches; light brown (7.5YR 6/4) very gravelly clay loam, brown (7.5YR 5/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 35 percent pebbles and 20 percent cobbles; few faint clay films on faces of peds and lining pores; violently effervescent; strongly alkaline (pH 8.8).

R—17 inches; quartzite bedrock.

Type location: White Pine County, Nevada; approximately 3 miles southwest of the North Chin Creek Reservoir; about 400 feet south and 100 feet east of the northwest corner of section 32, T.26 N., R.68 E.; USGS Chin Creek Reservoir 7.5 minute topographic quadrangle; 40 degrees, 5 minutes, 12.7 seconds north latitude and 114 degrees, 19 minutes, 58 seconds west longitude; UTM Zone 11, 727397e, 4440808n, NAD83.

Range in Characteristics:

Soil moisture: The soil is dry more than 60 to 70 percent of the time the soil temperature is above 41 degrees F. but continually moist 25 to 30 percent of the time. Aridic bordering on xeric moisture regime.

Soil temperature: 47 to 53 degrees F.

Mean summer soil temperature: 69 to 72 degrees F.

Solum thickness: 14 to 20 inches thick.

Depth to bedrock: 14 to 20 inches.

Electrical conductivity: 0 to 4 mmhos/cm.

Particle size control section:

Clay content—18 to 35 percent.

Rock fragments—35 to 60 percent.

A and BA horizons:

Hue—7.5YR or 10YR

Value—5 to 7 dry, 3 or 4 moist.

Chroma—2 or 3, dry or moist.

Reaction—Slightly alkaline to strongly alkaline.

Bt horizon:

Hue—10YR to 5YR.

Value—5 to 7 dry, 4 or 5 moist, dry or moist.

Chroma—3 or 4, dry or moist.

Texture—Loam or clay loam.

Reaction—Slightly alkaline to strongly alkaline.

Closkey series

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium to high

Landform: Rock pediments

Parent material: Kind — Colluvium and residuum; Source — Granite

Slope range: 4 to 30 percent

Elevation: 6,400 to 8,730 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 39 to 43 degrees F.

Frost-free period: 40 to 70 days

Taxonomic class: Loamy-skeletal, mixed, superactive, frigid Aridic Argixerolls

Typical pedon: Closkey very gravelly loamy coarse sand, in an area of soil map unit 2000, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with approximately 35 percent pebbles.

- A1—0 to 2 inches; grayish brown (10YR 5/2) very gravelly loamy coarse sand, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 40 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.
- A2—2 to 8 inches; grayish brown (10YR 5/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine and medium roots; common very fine interstitial and tubular pores; 35 percent pebbles; neutral (pH 7.3); clear wavy boundary.
- Bt1—8 to 16 inches; brown (10YR 5/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine through coarse roots; common very fine tubular and interstitial pores; few faint clay films bridging sand grains; 35 percent pebbles; neutral (pH 7.2); clear wavy boundary.
- Bt2—16 to 26 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine, and common medium and coarse roots; common very fine and fine tubular and interstitial pores; few faint clay films bridging sand grains and on faces of peds; 40 percent pebbles; neutral (pH 7.2); clear irregular boundary.
- Cr—26 to 60 inches; weathered granite.

Type location: White Pine County, Nevada; about 200 feet northwest of Mahogany Spring in Great Basin National Park; USGS Kiou Spring 7.5 minute topographic quadrangle; about 1,000 feet south and 1,300 feet west of the northeast corner of Section 31, T.13N., R.70 E. 38 degrees, 57 minutes, 37 seconds north latitude and 114 degrees, 09 minutes, 26 seconds west longitude; UTM Zone 11 746321e, 4316207n, NAD83.

Range in Characteristics:

Soil moisture: Usually dry; moist in winter and spring, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Aridic bordering on xeric soil moisture regime.

Soil temperature: 41 to 45 degrees F.

Mollic epipedon thickness: 10 to 16 inches; includes Bt1 horizon.

Depth to a paralithic contact: 20 to 40 inches.

Particle-size control section:

Percent clay—18 to 27 percent.

Sand in fine earth fraction—50 percent fine sand or coarser.

Rock fragments—35 to 50 percent, dominantly 2 to 5 mm diameter pebbles.

A horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Bt horizons:

Value—5 or 6 dry, 3 or 4 moist.

Chroma—3 or 4, dry or moist.

Texture—Sandy loam or sandy clay loam, sandy loam usually occurs in Bt1 horizon.

Clay content—18 to 27 percent.

Rock fragments—35 to 50 percent, most of pebbles are 2 to 5 mm. in diameter.

Structure—Fine and medium subangular blocky.

Consistence—Soft or slightly hard, dry, very friable or friable, moist.

Cobblywheel series

(Fig. 64)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Runoff: High

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Quartzite

Slope range: 15 to 50 percent

Elevation: 9,350 to 13,060 feet

Mean annual precipitation: 24 to 37 inches

Mean annual air temperature: 32 to 37 degrees F.

Frost-free period: 20 to 40 days



Figure 64—Profile of the Cobblywheel series.

Taxonomic class: Loamy-skeletal, mixed, active Xeric Haplocryolls

Typical pedon: Cobblywheel extremely cobbly loam, in an area of soil map unit 5330, wildlife habitat.

(Colors are for dry soil unless otherwise noted.) The soil surface is covered with 35 percent gravel, 30 percent cobbles, 5 percent stones, and 5 percent boulders.

Oa—0 to 2 inches; very dark brown (10YR 2/2) extremely cobbly highly decomposed organic material, black (10YR 2/1) moist; many very fine roots; 35 percent gravel, 30 percent cobbles, 5 percent stones, and 5 percent boulders; neutral (pH 6.9); clear smooth boundary.

A—2 to 15 inches; dark yellowish brown (10YR 4/4) extremely cobbly loam, dark brown (10YR 3/3) moist; moderate coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine and medium, and few coarse roots; common very fine and fine tubular and interstitial pores; 35 percent gravel and 25 percent cobbles; neutral (pH 7.2); clear smooth boundary.

Bkq—15 to 60 inches; yellowish brown (10YR 5/4) extremely cobbly loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, medium, and coarse roots; common fine and medium interstitial pores; few fine secondary calcium carbonate concretions on the bottom of rock fragments, few fine brittle silica masses on the bottom of rock fragments; 50 percent gravel and 35 percent cobbles; violently effervescent; neutral (pH 7.3).

Type location: White Pine County, Nevada; in Great Basin National Park about 1.1 miles northwest of Wheeler Peak; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 59 minutes, 56 seconds north latitude and 114 degrees, 19 minutes, 31 seconds west longitude; UTM zone 11, 0731634e, 4320055n; NAD83.

Range in Characteristics:

Soil moisture: Intermittently moist throughout the year. Most of the moisture that falls on this soil is in the form of snow and is removed by wind and sublimation. These soils are dry in all parts more than half of the cumulative days per year when the soil temperature is above 41 degrees F. Xeric soil moisture regime bordering on Aridic.

Mean annual soil temperature: 33 to 40 degrees F.

Mean summer soil temperature: 42 to 45 degrees F.

Thickness of the mollic epipedon: 10 to 16 inches.

Particle-size control section:

Clay content—12 to 18 percent.

Rock fragments—50 to 85 percent, mainly gravel and cobbles. Lithology of fragments is quartzite.

A horizon:

Value—3 or 4 moist.

Chroma—3 or 4 moist.

Consistence—Soft or slightly hard, dry.

Organic matter—1 to 2 percent.

Bkq horizon:

Value—5 or 6 dry, 3 or 4 moist.

Texture—Loam or sandy loam. Lower subhorizons are gravel or cobbles in some pedons.

Clay content—12 to 18 percent

Rock fragments—65 to 90 percent. Texture modifier is extremely cobbly.

Structure—Weak or moderate, medium or coarse subangular blocky.

Consistence—Soft or slightly hard, dry.

Concentrations—Secondary calcium carbonate and silica masses less than 2 millimeters thick on the bottom of rock fragments, 1 to 3 percent (by volume) of the horizon.

Calcium carbonate equivalent—1 to 5 percent.

Eaglepass series

Depth class: Very shallow

Drainage class: Well drained

Permeability: Moderately rapid.

Runoff: High to very high

Landform: Mountains

Parent material: Kind - Residuum and colluvium; Source - Limestone and dolomite

Slope range: 15 to 50 percent

Elevation: 6,200 to 6,360 feet

Mean annual precipitation: 8 to 12 inches

Mean annual air temperature: 48 to 52 degrees F.

Frost-free period: 100 to 120 days

Taxonomic class: Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents

Typical pedon: Eaglepass extremely gravelly loam, located in the soil survey of White Pine County, Nevada, East Part, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is partially covered with approximately 60 percent pebbles, 10 percent cobbles, and 15 percent stones.

A—0 to 2 inches; pale brown (10YR 6/3) extremely gravelly loam, dark brown (10YR 3/3); moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine interstitial pores; 60 percent pebbles, 10 percent cobbles, and 15 percent stones; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

C—2 to 6 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; soft, very friable, moderately sticky and slightly plastic; common fine and few medium roots; many very fine interstitial pores; 65 percent pebbles; violently effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary.

R—6 inches; hard limestone.

Type location: White Pine County, Nevada; approximately 500 feet west of jeep trail, 0.5 mile west of Essex Canyon, 2 miles north of Pleasant Valley, and 0.75 mile west of the Utah state line; about 400 feet north and 400 feet west of the southeast corner of section 4, T. 21 N., R. 70 E.; USGS Skinner Canyon Quad 7.5 minute topographic quadrangle; 39 degrees, 43 minutes, 08.7 seconds north latitude and 114 degrees, 03 minutes, 42.0 seconds west longitude; UTM Zone 11, 751860e, 4400708n, NAD83.

Range in Characteristics:

Soil moisture: Usually dry, moist in winter and spring months, dry in summer and fall except for 10 to 20 days cumulative between July to October due to convection storms. Aridic bordering on Xeric soil moisture regime.

Soil temperature: 50 to 53 degrees F.

Depth to bedrock: 4 to 6 inches.

Reaction: Moderately alkaline or strongly alkaline.

Carbonates: Calcareous in all parts, violently effervescent. Less than 20 millimeter fraction contains more than 40 percent calcium carbonate equivalent.

Particle-size control section:

Clay content—8 to 18 percent.

Rock fragments—60 to 75 percent, includes pebbles, cobbles and stones.

A horizon:

Value—5 through 7 dry, 3 through 5 moist.

Chroma—2 through 4, dry or moist.

C horizon:

Value—6 or 7 dry, 4 or 5 moist.

Chroma—3 or 4, dry or moist.

Texture of fine earth—Loam, fine sandy loam or sandy loam.

Structure—Weak or moderate, fine or medium, subangular blocky.

Consistence—Nonsticky to moderately sticky.

Other features—Secondary calcium carbonate pendants and coats are on rock fragments in some pedons

Eenreed series

(Fig. 65)

Depth class: Very deep*Drainage class:* Well drained*Permeability:* Moderate*Runoff:* Medium or high*Landform:* Fan remnants*Parent material:* Kind — Alluvium; Source — Quartzite, shale and limestone*Slope range:* 4 to 50 percent*Elevation:* 6,590 to 7,510 feet*Mean annual precipitation:* 12 to 18 inches*Mean annual air temperature:* 43 to 45 degrees F.*Frost-free period:* 70 to 100 days**Taxonomic class:** Loamy-skeletal, mixed, superactive, frigid Aridic Calcixerolls

Typical pedon: Eenreed very gravelly loam, located in map unit 1700 in the soil survey of Snake Range Area, Nevada, about 1,560 feet north of the Great Basin National Park boundary, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 80 percent pebbles and less than 1 percent stones.

A1—0 to 2 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 45 percent pebbles; slightly alkaline (pH 7.8); abrupt smooth boundary.

A2—2 to 5 inches; grayish brown (10YR 5/2) very gravelly loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine, medium, and coarse roots; common very fine tubular and interstitial pores; 45 percent pebbles; slightly alkaline (pH 7.8); abrupt smooth boundary.

Bt—5 to 12 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine, common fine, medium, and coarse roots; common very fine tubular and interstitial pores; few faint clay films on faces of peds and lining pores; 50 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk1—12 to 47 inches; white (10YR 8/1) extremely gravelly loam, light gray (10YR 7/2) moist; massive, hard, firm, slightly sticky and slightly plastic; common very fine and few fine roots; few very fine tubular pores; 60 percent pebbles, 5 percent cobbles, and 5 percent stones; many (20 percent) secondary calcium carbonate concretions around rock fragments and finely disseminated throughout the matrix; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

Bk2—47 to 60 inches; very pale brown (10YR 8/2) extremely gravelly sandy loam, pale brown (10YR 6/3) moist; massive; hard, firm, slightly sticky and nonplastic; 60 percent pebbles, 5 percent cobbles, and 5 percent stones; common (15 percent) secondary calcium carbonate concretions around rock fragments and finely disseminated throughout the matrix; violently effervescent; strongly alkaline (pH 8.6).

Type location: White Pine County, Nevada; 0.25 mile east of Great Basin National Park about 0.75 mile south of Mill Creek; USGS Lehman Caves 7.5 minute topographic quadrangle; 39 degrees, 02 minutes, 25 seconds north latitude, and 114 degrees, 14 minutes, 18 seconds west longitude; UTM zone 11, 739022e, 4324870n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter and spring, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days

cumulative due to convection storms between July and September; Aridic soil moisture regime that borders on xeric.

Mean annual soil temperature: 44 to 47 degrees F.



Figure 65—The Eenreed soil has a well developed calcic horizon below 40 cm.

Mollic epipedon thickness: 7 to 16 inches; includes the Bt horizon.

Depth to effervescent matrix: 2 to 8 inches (upper 7 inches calcareous throughout when mixed).

Depth to secondary carbonates: 7 to 16 inches.

Particle-size control section:

Clay content—18 to 27 percent.

Rock fragments—50 to 80 percent, mainly pebbles. Lithology of fragments is dominantly quartzite.

A horizons:

Value—4 or 5 dry.

Chroma—2 or 3, dry or moist.

Organic matter content—1 or 2 percent.

Bt horizon:

Value—4 or 5 dry, 3 or 4 moist.

Chroma—2 or 3, dry or moist.

Clay content—18 to 27 percent.

Rock fragments—50 to 80 percent, mainly as pebbles.

Organic matter content—1 or 2 percent.

Reaction—Slightly alkaline or moderately alkaline.

Effervescence—Slightly effervescent or strongly effervescent.

Other features—Some pedons have subhorizons with dry value of 6, moist value of 4, and chroma of 4.

Calcium carbonate equivalent—1 to 5 percent.

Bk horizons:

Value—6 through 8 dry, 5 through 7 moist.

Chroma—1 through 3 dry, 2 through 4 moist.

Texture—Loam or Sandy loam.

Clay content—12 to 20 percent.

Rock fragments—60 to 85 percent, mainly as pebbles.

Consistence—Slightly hard or very hard dry, very friable to firm moist, nonplastic or slightly plastic; some pedons may have discontinuous bands of extremely hard material.

Reaction—Moderately alkaline or strongly alkaline.

Carbonates—Distinct to prominent secondary calcium carbonate concretions around or on the bottom of rock fragments.

Calcium carbonate equivalent—15 to 20 percent.

Gaia series

(Fig. 66)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately rapid

Runoff: Medium

Landform: Ground moraines

Parent material: Kind — Till; Source — Quartzite and minor amounts of granite

Slope range: 15 to 50 percent

Elevation: 7,810 to 11,020 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Loamy-skeletal, mixed, superactive Xeric Haplocryolls

Typical pedon: Gaia extremely gravelly loam, in an area of soil map unit 5311, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with approximately 30 percent pebbles, 5 percent cobbles, and 15 percent stones.

A1—0 to 6 inches; dark grayish brown (10YR 4/2) extremely gravelly loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine, and common medium and coarse roots; common very fine tubular and interstitial pores; 45 percent pebbles, 5 percent cobbles, and 10 percent stones; slightly acid (pH 6.4) clear wavy boundary.

A2—6 to 11 inches; grayish brown (10YR 5/2) extremely gravelly loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine, and common medium and coarse roots; common very fine tubular and interstitial pores; 45 percent pebbles, 10 percent cobbles, and 10 percent stones; slightly acid (pH 6.4) clear wavy boundary.

C1—11 to 17 inches; light gray (10YR 7/2) extremely cobbly sandy loam, grayish brown (10YR 5/2) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine tubular pores; 40 percent pebbles and 30 percent cobbles; neutral (pH 6.6); clear wavy boundary.

C2—17 to 60 inches; light gray (10YR 7/2) extremely cobbly sandy loam, grayish brown (10YR 5/2) moist; massive, slightly hard, very friable, slightly sticky and nonplastic; few very fine and common fine roots; common very fine tubular and interstitial pores; few 2 to 20 mm thick discontinuous lamellae which are light yellowish brown (10YR 6/4), dark yellowish brown (10YR 4/4) moist with clay films bridging sand grains; 35 percent pebbles and 40 percent cobbles; neutral (pH 6.6).

Type location: White Pine County, Nevada; about 1.5 miles west of Upper Lehman Campground in Great Basin National Park; USGS Windy Peak 7.5 minute topographic quadrangle; approximately 39 degrees, 01 minute, 04 seconds north latitude and 114 degrees, 16 minutes, 55 seconds west longitude; UTM Zone 11 735321e, 4322259n, NAD83.



Figure 66—The Gaia series has little soil development other than accumulation of organic matter, which darkens the soil surface layer.

Range in Characteristics:

Soil moisture: Usually moist; moist in spring, winter and early summer, dry in all parts for 60 to 90 days consecutively following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime.

Soil temperature: 40 to 45 degrees F.

Mean summer soil temperature: 45 to 47 degrees F.

Mollic epipedon thickness: 8 to 15 inches

Profile reaction: Slightly acid or neutral.

Other features: Some pedons have an O horizon above the mollic epipedon.

Particle-size control section:

Clay content—Averages 8 to 18 percent.

Rock fragments—Averages 65 to 90 percent, dominantly pebbles and cobbles. Lithology of the fragments is mostly quartzite.

A horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

C horizons:

Value—6 or 7 dry, 4 or 5 moist.

Chroma—2 or 3, dry or moist.

Other features—Some pedons have discontinuous lamellae 2 to 20 mm thick (and sometimes pockets) of high chroma material typically have loam or sandy clay loam textures, and the cumulative thickness is 1 to 3 inches.

Garnel series

(Figs. 67, 68)

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderate

Runoff: High or very high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Granite

Slope range: 8 to 75 percent

Elevation: 6,530 to 8,660 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 39 to 43 degrees F.

Frost-free period: 40 to 70 days

Taxonomic class: Loamy-skeletal, mixed, superactive, frigid, shallow Aridic Argixerolls

Typical pedon: Garnel very gravelly coarse sandy loam, in an area of soil map unit 5110, forestland (Colors are for dry soil unless otherwise noted.) The surface is covered with approximately 50 percent pebbles, 2 percent cobbles, and 1 percent stones.

A1—0 to 2 inches; grayish brown (10YR 5/2) very gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 50 percent pebbles; slightly acid (pH 6.3); clear smooth boundary.

A2—2 to 7 inches; brown (10YR 5/3) extremely gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine tubular and interstitial pores; 60 percent pebbles; neutral (pH 7.0); clear wavy boundary.

Bt—7 to 12 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, moderately sticky and slightly plastic; few very fine and medium, and common fine roots; common very fine tubular and interstitial pores; common distinct clay films on faces of peds; 55 percent pebbles; neutral (pH 7.0); clear irregular boundary.

Cr—12 to 20 inches; weathered granite.

Type location: White Pine County, Nevada; about 0.75 mile south of Strawberry Creek in Great Basin National Park; USGS Windy Peak 7.5 minute topographic quadrangle; 1,800 feet north and 2,200 feet east of the southwest corner of Section 29; T.14 N. R.69 E; 39 degrees, 03 minutes, 16 seconds north



Garnet soils (Fig. 67) are shallow over weathered granitic bedrock. They support a pinyon-juniper forestland ecological site, (Fig. 68) with mountain big sagebrush in the understory.

Figure 67



Figure 68

latitude and 114 degrees, 15 minutes, 16 seconds west longitude; UTM Zone 11 737580e, 4326400n, NAD83.

Range in Characteristics:

Soil moisture: Usually dry; moist in winter and spring, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Aridic bordering on xeric soil moisture regime.

Soil temperature: 41 to 45 degrees F.

Mollic epipedon thickness: 7 to 10 inches thick.

Depth to paralithic contact: 10 to 14 inches.

Depth to unweathered bedrock: 20 to 40 inches.

Particle-size control section:

Clay content—Averages 20 to 27 percent.

Rock fragments—Averages 35 to 60 percent, dominantly pebbles. Lithology of the fragments is granitic rocks.

A horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Bt horizon:

Value—4 or 5 moist.

Chroma—3 or 4, dry or moist.

Clay content—20 to 27 percent.

Rock fragments—35 to 60 percent.

Structure—Fine or medium subangular blocky.

Consistence—Slight hard or hard, dry.

Glideski series

(Fig. 69)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Runoff: Low or medium

Landform: Stream terraces

Parent material: Kind — Outwash and alluvium; Source — Quartzite, granite and minor amounts of limestone

Slope range: 4 to 15 percent

Elevation: 6,200 to 9,190 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 39 to 43 degrees F.

Frost-free period: 40 to 70 days

Taxonomic class: Loamy-skeletal, mixed, superactive, frigid Typic Argixerolls

Typical pedon: Glideski gravelly loam, in an area of soil map unit 5432, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 20 percent gravel, 15 percent cobbles, 10 percent stones and 2 percent boulders.

A1—0 to 4 inches; brown (10YR 4/3) gravelly loam, very dark brown (10YR 2/2) moist; moderate coarse subangular blocky structure parting to moderate medium granular; soft, very friable, slightly sticky and

nonplastic; many very fine, common fine, and few medium roots; common very fine and fine, and few medium tubular and interstitial pores; 25 percent gravel and 5 percent cobbles; neutral (pH 7.1); clear smooth boundary.

A2—4 to 14 inches; brown (10YR 4/3) very cobbly loam, very dark grayish brown (10YR 3/2) moist; strong coarse subangular blocky structure parting to strong medium granular; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine, and few medium roots; common very fine and fine, and few medium tubular and interstitial pores; 30 percent gravel, 15 percent cobbles, and 5 percent stones; neutral (pH 6.7); clear smooth boundary.

Bt1—14 to 24 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate coarse subangular blocky structure parting to weak fine subangular blocky; hard, firm, slightly sticky and slightly plastic; common very fine and fine, and few medium roots; common very fine, fine, and medium, and few coarse interstitial pores; many faint clay films on faces of peds; 30 percent gravel, 25 percent cobbles, and 15 percent stones; neutral (pH 6.7); clear smooth boundary.

Bt2—24 to 39 inches; light yellowish brown (10YR 6/4) extremely stony loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, firm, moderately sticky and slightly plastic; few very fine, fine, and medium roots; common very fine, fine, medium, and coarse interstitial pores; common faint clay films on faces of peds; 30 percent gravel, 25 percent cobbles, and 20 percent stones; neutral (pH 6.7); clear smooth boundary.

C—39 to 60 inches; pale brown (10YR 6/3) extremely stony loam, brown (10YR 4/3) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; common very fine, fine, and medium, and few coarse interstitial pores; 30 percent gravel, 20 percent cobbles, and 20 percent stones; neutral (pH 6.9).

Type location: White Pine County, Nevada; the south end of the Snake Range, about 0.5 mile west of the old corrals, up Strawberry Creek and 25 feet south of the jeep trail; USGS Windy Peak 7.5 minute topographic quadrangle; 39 degrees, 03 minutes, 14 seconds north latitude and 114 degrees, 18 minutes, 30 seconds west longitude; UTM zone 11, 0732909e, 4326210n, NAD83.



Figure 69—The Glideski soil displays development of an argillic horizon, a zone of clay accumulation, below 30 cm.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime.

Mean annual soil temperature: 41 to 45 degrees F.

Mollic epipedon thickness: 10 to 16 inches.

Argillic horizon thickness: 15 to 26 inches.

Particle-size control section:

Clay content—Averages 20 to 26 percent.

Rock fragments—50 to 75 percent, mainly cobbles and stones. Lithology of the fragments is mainly quartzite and granite.

A horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Organic matter content—2 to 4 percent.

Bt horizons:

Value—5 or 6 dry, 4 or 5 moist.

Chroma—4 or 6, dry or moist.

Texture—Loam or sandy clay loam. Some pedons have lower subhorizons with clay loam textures.

Clay content—20 to 26 percent. Some pedons have subhorizons with 27 to 32 percent clay in the lower part.

Rock fragments—50 to 75 percent, mainly cobbles and stones.

Structure—Weak to moderate, fine to coarse subangular blocky.

Consistence—Hard or slightly hard, dry.

C horizon:

Chroma—3 or 4, dry or moist.

Texture—Coarse sandy loam, loam or loamy coarse sand.

Clay content—6 to 18 percent.

Rock fragments—60 to 80 percent.

Structure—Subangular blocky or single grain.

Goodski series

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Moderately rapid

Runoff: Medium or high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Granite

Slope range: 8 to 50 percent

Elevation: 7,120 to 10,500 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Loamy-skeletal, mixed, superactive Pachic Haplocryolls

Typical pedon: Goodski very gravelly loam, in an area of soil map unit 5350, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with approximately 50 percent gravel, 5 percent cobbles, and 2 percent stones.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine, and few fine and medium tubular and interstitial pores; 40 percent gravel; neutral (pH 6.8); clear smooth boundary.

A2—4 to 10 inches; dark grayish brown (10YR 4/2) very gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure parting to strong medium granular; slightly hard, very friable, slightly sticky and nonplastic; many very fine, common fine, and few medium roots; common very fine and fine, and few medium tubular and interstitial pores; 40 percent gravel; neutral (pH 7.1); clear smooth boundary.

A3—10 to 17 inches; grayish brown (10YR 5/2) very gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure parting to moderate medium granular; slightly hard, friable, slightly sticky and nonplastic; common very fine, fine, and medium roots; common very fine and fine, and few medium interstitial and tubular pores; 40 percent gravel and 5 percent cobbles; neutral (pH 6.8); clear smooth boundary.

AB—17 to 28 inches; brown (10YR 5/3) very gravelly coarse sandy loam, dark brown (10YR 3/3) moist; strong fine subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few very fine, fine, and medium roots; common very fine and fine, and few medium interstitial and tubular pores; 39 percent gravel and 20 percent cobbles; neutral (pH 7.2); clear smooth boundary.

Cr—28 to 30 inches; pale brown (10YR 6/3) moderately weathered granite, brown (10YR 4/3) moist; excavation difficulty is moderate; few fine roots in fracture planes; few very fine irregular and tubular pores; neutral (pH 7.3).

R—30 inches; indurated granite.

Type location: White Pine County, Nevada; in the south Snake Range, in Great Basin National Park, up Snake Creek, about 1.5 miles northwest of Shoshone Campground, about 0.3 mile north of the drainage bottom and 300 feet below an old spring development; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 56 minutes, 24 seconds north latitude and 114 degrees, 15 minutes, 29 seconds west longitude; UTM zone 11, 0737643e, 4313707n, NAD 83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime.

Mean annual soil temperature: 40 to 45 degrees F.

Mean summer soil temperature: 47 to 50 degrees F.

Mollic epipedon thickness: 20 to 30 inches.

Depth to paralithic contact: 20 to 38 inches.

Depth to indurated bedrock: 21 to 40 inches.

Particle-size control section:

Clay content—Averages 12 to 18 percent.

Rock fragments—Averages 35 to 60 percent, mainly gravel. Lithology of the fragments is granite.

A1 horizon:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Organic matter content—2 to 4 percent.

A2 and A3 horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Organic matter content—2 to 4 percent.

Texture—Sandy loam or coarse sandy loam.

Clay content—10 to 17 percent.

Rock fragments—40 to 60 percent, 30 to 40 percent 2 to 5 mm gravel with 10 to 20 percent cobbles.

AB horizon:

Chroma—2 or 3, dry or moist.

Texture—Sandy loam or coarse sandy loam.

Clay content—12 to 16 percent.

Rock fragments—40 to 60 percent, 30 to 40 percent 2 to 5 mm gravel with 10 to 20 percent cobbles.

Structure—Moderate or strong, fine or medium subangular blocky.

Cr horizon:

Chroma—3 or 4, dry or moist.

Grube series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately slow

Runoff: High to very high

Landform: Mountains

Parent material: Kind — Colluvium; Source — Quartzite

Slope range: 15 to 50 percent

Elevation: 6,360 to 7,640 feet

Mean annual precipitation: 12 to 14 inches

Mean annual air temperature: 43 to 45 degrees F.

Frost-free period: 90 to 100 days

Taxonomic class: Loamy-skeletal, mixed, superactive, frigid Calciargidic Argixerolls

Typical pedon: Grube extremely cobbly loam, in the soil survey of White Pine County, Nevada, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered by 15 percent pebbles, 30 percent cobbles, and 10 percent stones.

A1—0 to 5 inches; grayish brown (10YR 5/2) extremely cobbly loam, very dark grayish brown (10YR 3/2) moist; weak very fine and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, many fine, and few medium roots; many very fine and fine tubular pores; 15 percent pebbles, 35 percent cobbles, and 10 percent stones; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary.

A2—5 to 11 inches; brown (10YR 5/3) extremely cobbly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine, common fine, common medium, few coarse, and very coarse roots; many very fine and many fine tubular pores; 25 percent pebbles, 35 percent cobbles, and 5 percent stones; noneffervescent; slightly alkaline (pH 7.6); clear smooth boundary.

Bt—11 to 26 inches; yellowish brown (10YR 5/4) extremely cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, very friable, moderately sticky and moderately plastic; common fine, few medium, coarse, and very coarse roots; common fine and medium tubular pores and common fine interstitial pores; 30 percent pebbles, 35 percent cobbles, and

2 percent stones; common distinct clay films on faces of peds; noneffervescent; slightly alkaline (pH 7.8); clear smooth boundary.

Btk—26 to 39 inches; light yellowish brown (10YR 6/4) extremely cobbly clay loam, yellowish brown (10YR 5/4) moist; moderate fine subangular blocky structure; hard, very friable, moderately sticky and moderately plastic; common fine, few medium, and coarse roots; common fine and medium tubular pores and common fine interstitial pores; 30 percent pebbles, 30 percent cobbles, and 2 percent stones; common faint clay films on faces of peds; strongly effervescent; secondary carbonates segregated as many prominent coats on bottoms of rock fragments; moderately alkaline (pH 8.2); clear smooth boundary.

Bkq—39 to 60 inches; very pale brown (10YR 8/2) extremely cobbly loam, very pale brown (10YR 7/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine, medium, and coarse roots; common fine tubular and interstitial pores; 30 percent pebbles, 30 percent cobbles, and 5 percent stones; violently effervescent; secondary carbonates segregated as many prominent coats on rock fragments; few faint coats of opaline silica on bottoms of rock fragments; moderately alkaline (pH 8.4).

Type location: White Pine County, Nevada; about 4 miles south of White Cloud Mountain; about 2,100 feet east and 1,650 feet south of the northwest corner of section 10, T.18 N., R.68 E.; USGS Third Butte East 7.5 minute topographic quadrangle; 39 degrees, 26 minutes, 18 seconds north latitude and 114 degrees, 18 minutes, 51 seconds west longitude; UTM Zone 11, 731145e, 4368864n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter and spring, dry from June through October except for 10 to 20 days cumulative due to convection storms between July and October; aridic moisture regime that borders on xeric.

Mean annual soil temperature: 44 to 47 degrees F.

Mollic epipedon thickness: 10 to 15 inches; does not include the Bt horizon.

Depth to base of argillic horizon: 30 to 48 inches.

Depth to identifiable secondary calcium carbonates: 20 to 30 inches.

Depth to calcic horizon: 25 to 40 inches.

Particle-size control section:

Clay content—28 to 35 percent.

Rock fragments—Averages 60 to 80 percent, mainly cobbles and some stones. Lithology of fragments are mainly quartzite.

A horizons:

Value—2 or 3 moist.

Chroma—2 or 3, dry or moist.

Organic matter content—1 or 2 percent.

Bt horizon:

Value—3 or 4 moist.

Clay content—28 to 35 percent.

Structure—Fine or medium subangular blocky.

Consistence—Hard to very hard dry, very friable to friable moist.

Btk horizon:

Value—6 or 7 dry, 5 or 6 moist.

Chroma—3 or 4, dry or moist.

Clay content—28 to 35 percent.

Structure—Fine or medium subangular blocky.

Consistence—Hard to very hard dry, very friable to friable moist.

Calcium carbonate equivalent—5 to 20 percent.

Other features—This horizon qualifies as a calcic horizon in some pedons.

Bkq horizon:

Value—7 or 8 dry, 6 or 7 moist.

Chroma—2 or 3, dry or moist.

Clay content—10 to 18 percent.

Structure—Fine or medium subangular blocky.

Rock fragments—60 to 80 percent.

Calcium carbonate equivalent—15 to 30 percent.

Haunchee series

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium to very high

Landform: Mountains

Parent material: Kind - Residuum and colluvium; Source – Limestone and dolomite

Slope range: 15 to 75 percent

Elevation: 7,710 to 10,240 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 36 to 45 degrees F.

Frost-free period: 30 to 70 days

Taxonomic class: Loamy-skeletal, carbonatic Lithic Cryrendolls

Typical pedon: Haunchee very stony loam, in the soil survey of White Pine County, Nevada, rangeland.

(A reference pedon located in Great Basin National Park is in map unit 4200 at latitude 38.86369 degrees N and longitude 114.217993 degrees W. Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with approximately 30 percent pebbles, 15 percent cobbles, and 15 percent stones.

A1—0 to 3 inches; dark brown (10YR 3/3) very stony loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine interstitial and few fine tubular pores; 25 percent pebbles, 5 percent cobbles, and 10 percent stones; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

A2—3 to 15 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; common very fine and fine, and few medium roots; common very fine and fine interstitial pores; 35 percent pebbles, 10 percent cobbles, and 5 percent stones; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

R—15 inches; hard limestone.

Type location: White Pine County, Nevada; approximately 2.5 miles northwest of Tippet Springs in the Antelope Range; about 1,250 feet south and 2,000 feet west of the northeast corner of section 9, T.23 N, R.67 E.; USGS Baldy Peak 7.5 minute topographic quadrangle; 39 degrees, 53 minutes, 19 seconds north latitude and 114 degrees, 24 minutes, 20 seconds west longitude; UTM Zone 11, 721834e, 4418617n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist, moist mid fall through early summer, dry mid summer through early fall.

Xeric soil moisture regime bordering on Aridic.

Soil temperature: 42 to 46 degrees F.

Summer soil temperature: 55 to 59 degrees F.

Depth to bedrock: 10 to 20 inches.

Reaction: Slightly alkaline or moderately alkaline in the surface layer and moderately alkaline or strongly alkaline below.

Effervescence: Strongly effervescent or violently effervescent throughout.

Calcium carbonate equivalent: 40 to 70 percent.

Particle-size control section:

Clay content—Averages 10 to 20 percent.

Texture—Very fine sandy loam or loam.

Rock fragments—Averages 35 to 60 percent mainly pebbles with up to 20 percent stones and cobbles in some pedons.

A horizons:

Hue—10YR or 7.5YR.

Value—3 through 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Highup series

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium to high

Landform: Mountains

Parent material: Kind - Colluvium and residuum; Source - Limestone

Slope range: 30 to 75 percent

Elevation: 7,380 to 8,600 feet

Mean annual precipitation: 16 to 24 inches

Mean annual air temperature: 43 to 45 degrees F.

Frost-free period: 70 to 90 days

Taxonomic class: Loamy-skeletal, carbonatic, frigid Typic Calcixerolls

Typical pedon: Highup extremely gravelly silt loam, located in the soil survey of White Pine County, Nevada, East Part, rangeland. (Colors are for dry soil unless otherwise noted). The surface is partially covered with 70 percent pebbles, 5 percent cobbles, and 3 percent stones.

A1—0 to 2 inches; dark grayish brown (10YR 4/2) extremely gravelly silt loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to weak fine and medium granular; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; 70 percent pebbles, 5 percent cobbles, and 5 percent stones; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

A2—2 to 10 inches; brown (10YR 4/3) extremely gravelly silt loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and medium and few coarse roots; common fine tubular pores; 70 percent pebbles and 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk1—10 to 15 inches; brown (10YR 5/3) extremely gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine and few medium roots; common fine tubular pores; 60 percent pebbles; many distinct secondary calcium carbonate coats and pendants on bottom of pebbles; violently effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

Bk2—15 to 25 inches; light gray (10YR 7/2) extremely gravelly loam, light brownish gray (10YR 6/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and medium roots; common fine tubular pores; 60 percent pebbles; many distinct secondary calcium carbonate coats and pendants on bottom of pebbles; violently effervescent; strongly alkaline (pH 8.5); abrupt wavy boundary.

R—25 inches; hard limestone bedrock.

Type location: White Pine County, Nevada; approximately 2.5 miles east of Tungstonia; about 250 feet west and 680 feet south of the northeast corner of section 36, T.21 N., R.69 E.; USGS Skinner Canyon 7.5 minute topographic quadrangle; 39 degrees, 39 minutes, 30 seconds north latitude and 114 degrees, 7 minutes, 03 seconds west longitude; UTM Zone 11, 747291e, 4393809n, NAD83.

Range in Characteristics:

Soil moisture: moist in winter and spring, dry in summer and fall except for 10 to 20 days cumulative between July and October due to convection storms.

Soil temperature: 43 to 47 degrees F.

Thickness of the mollic epipedon: 15 to 20 inches commonly includes the upper part of the Bk horizon.

Calcium carbonate equivalent: 20 to 35 percent in the < 2mm fraction, and 40 to 60 in the < 20 mm fraction.

Depth to bedrock: 20 to 40 inches.

Depth to calcic horizon: 5 to 11 inches

Particle-size control section:

Clay content—Averages 12 to 18 percent.

Rock fragments—Averages 50 to 75 percent, mostly limestone pebbles.

A horizons:

Hue—7.5YR or 10YR.

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Reaction—Slightly alkaline through strongly alkaline

Effervescence – Slightly effervescent or strongly effervescent

Bk horizons:

Hue—10YR or 7.5YR. Value—4 through 7 dry, 3 through 6 moist.

Chroma—2 through 4, dry or moist.

Texture of fine earth—Silt loam or loam.

Consistence—Nonsticky or slightly sticky and nonplastic or slightly plastic.

Rock fragments—50 to 75 percent, mainly limestone pebbles.

Effervescence—Strongly effervescent or violently effervescent.

Reaction—Moderately alkaline or strongly alkaline.

Hyzen series

Depth class: Shallow and very shallow

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium to very high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Limestone and dolomite

Slope range: 15 to 75 percent

Elevation: 6,230 to 10,600 feet

Mean annual precipitation: 12 to 16 inches

Mean annual air temperature: 39 to 45 degrees F.

Frost-free period: 70 to 100 days

Taxonomic class: Loamy-skeletal, carbonatic, frigid Lithic Haploxerolls

Typical pedon: Hyzen extremely stony loam, in the soil survey of Western White Pine County, Nevada, rangeland. A reference pedon in Great Basin National Park is located in map unit 2103 at latitude 38.9195 degrees N and longitude 114.1513 degrees W. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 45 percent pebbles, 10 percent cobbles and 20 percent stones.

A—0 to 2 inches; grayish brown (10YR 5/2) extremely stony loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine and medium roots; few very fine and fine vesicular and interstitial pores; common faint calcium carbonate pendants on bottoms of rock fragments; 40 percent pebbles, 10 percent cobbles and 15 percent stones; violently effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

ABk—2 to 12 inches; brown (10YR 5/3) extremely stony loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; many fine through coarse roots; common fine and medium tubular pores; common faint calcium carbonate pendants on bottom of rock fragments; 20 percent pebbles, 20 percent cobbles and 20 percent stones; violently effervescent; moderately alkaline (pH 8.4); abrupt irregular boundary.

R—12 inches; gray (10YR 6/1) fractured limestone; fractures partly filled with secondary calcium carbonate; few coarse roots in fractures.

Type location: White Pine County, Nevada; on Squaw Peak; about 2,480 feet west and 2,800 feet south of the projected northeast corner of section 8 T.16 N., R.63 E.; USGS Ruth 7.5 minute topographic quadrangle; 39 degrees, 16 minutes, 01 second north latitude and 114 degrees, 54 minutes, 31 seconds west longitude; UTM Zone 11, 680422e, 4348485n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist, moist in winter, spring and early summer, dry in late summer and fall. Aridic soil moisture regime bordering on xeric.

Soil temperature: 43 to 47 degrees F.

Mollic epipedon thickness: 6 to 14 inches.

Depth to bedrock: 6 to 14 inches.

Calcium carbonate equivalent: 40 to 60 percent of the less than 20 millimeter fraction.

Particle-size control section:

Clay content—Averages 10 to 18 percent.

Rock fragments—Averages 60 to 85 percent with more than half cobbles and stones.

A and ABk horizons:

Value—4 or 5 dry.

Chroma—2 or 3, dry or moist.

Organic matter content—2 to 5 percent.

Jonlake series

(Figs. 70, 71)

Depth class: Shallow



Jonlake soils (Fig. 70) are shallow over hard quartzite bedrock. They have little development beyond organic matter accumulation near the surface. A low sagebrush-grass ecological site is typical on this soil. (Fig. 71)

Figure 70



Figure 71

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium to very high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Quartzite with local admixtures of argillite

Slope range: 8 to 75 percent slopes

Elevation: 6,820 to 10,500 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Loamy-skeletal, mixed, superactive Lithic Haplocryolls

Typical pedon: Jonlake extremely gravelly loam, in an area of soil map unit 5261, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 40 percent pebbles, 20 percent cobbles, and 2 percent stones.

A1—0 to 6 inches; grayish brown (10YR 5/2) extremely gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine tubular and interstitial pores; 55 percent pebbles and 10 percent cobbles; neutral (pH 6.8); clear wavy boundary.

A2—6 to 11 inches; grayish brown (10YR 5/2) extremely gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine tubular and interstitial pores; 65 percent pebbles and 5 percent cobbles; neutral (pH 6.8); clear wavy boundary.

A3—11 to 14 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine tubular and interstitial pores; 55 percent pebbles; neutral (pH 6.8); clear wavy boundary.

C—14 to 17 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, moderately sticky and slightly plastic; common very fine and fine roots; common very fine tubular and interstitial pores; 60 percent pebbles; neutral (pH 6.8); abrupt irregular boundary.

R—17 inches; hard quartzite bedrock.

Type location: White Pine County, Nevada; about 0.25 mile north of Pine Creek in Great Basin National Park; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 59 minutes, 59 seconds north latitude, 114 degrees, 20 minutes, 45 seconds west longitude; UTM Zone 11, 729847e, 4320091n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist; moist in winter, spring and early summer dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime.

Soil temperature: 40 to 45 degrees F.

Mean summer soil temperature: 44 to 47 degrees F.

Mollic epipedon thickness: 7 to 15 inches.

Depth to bedrock: 12 to 20 inches.

Particle-size control section:

Clay content—Averages 18 to 25 percent.

Rock fragments—Averages 50 to 80 percent, dominantly pebbles. Lithology of fragments is dominantly quartzite.

A horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Reaction—Slightly acid or neutral.

C horizon:

Value—6 or 7 dry, 3 or 4 moist.

Chroma—2 through 4, dry or moist.

Consistence—Slightly sticky or moderately sticky.

Rock fragments—Averages 50 to 80 percent, dominantly pebbles.

Reaction—Slightly acid or neutral.

Jumble series

(Figs. 72, 73)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Runoff: High

Landform: Moraines

Parent material: Kind — Till; Source — Quartzite and granite

Slope range: 8 to 50 percent

Elevation: 9,400 to 11,020 feet

Mean annual precipitation: 24 to 37 inches

Mean annual air temperature: 35 to 39 degrees F.

Frost-free period: 30 to 50 days

Taxonomic class: Loamy-skeletal, mixed, superactive Lamellic Dystrocryepts

Typical pedon: Jumble extremely stony loam, in an area of soil map unit 5311, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 20 percent gravel, 20 percent cobbles, 15 percent stones, and 2 percent boulders.

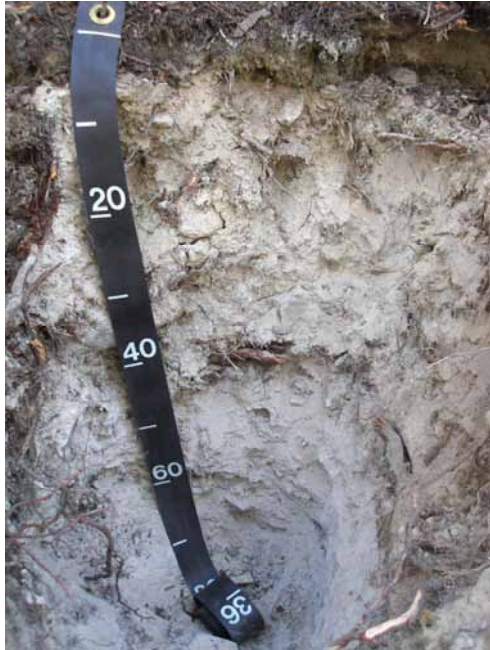
Oi—0 to 1 inch; slightly decomposed plant material composed of conifer needles; abrupt wavy boundary.

A—1 to 6 inches; pale brown (10YR 6/3) extremely stony loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; common very fine tubular and interstitial pores; 40 percent gravel, 10 percent cobbles, and 15 percent stones; moderately acid (pH 5.8); clear smooth boundary.

E1—6 to 12 inches; light gray (10YR 7/2) extremely gravelly sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium, and few coarse roots; 50 percent gravel and 10 percent cobbles; slightly acid (pH 6.2); clear wavy boundary.

E2—12 to 19 inches; light gray (10YR 7/2) extremely cobbly sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine, few medium, and coarse roots; common very fine tubular and interstitial pores; 35 percent gravel, 25 percent cobbles, and 15 percent stones; slightly acid (pH 6.4); clear wavy boundary.

E and Bt—19 to 61 inches; light gray (10YR 7/2) extremely cobbly sandy loam, brown (10YR 5/3) moist (E part), with common light yellowish brown (10YR 6/4) 2 to 10 mm thick lamellae of sandy loam, dark yellowish brown (10YR 4/4) moist (Bt part); massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine tubular pores; common distinct clay films bridging sand grains and lining pores within lamellae; 15 percent gravel, 45 percent cobbles, and 10 percent stones; strongly acid (pH 5.4).



Jumble soils (Fig. 72) are very deep, minimally developed soils formed in till. They support a forestland ecological site dominated by Englemann's spruce. (Fig. 73)

Figure 72



Figure 73

Type location: White Pine County, Nevada; in Great Basin National Park about 1,000 feet southeast of Wheeler Peak Campground; USGS Windy Peak 7.5 minute topographic quadrangle; 39 degrees, 00 minutes, 31 seconds north latitude, and 114 degrees, 17 minutes, 55 seconds west longitude; UTM zone 11 733908e, 4321204n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in the moisture control section in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime.

Mean annual soil temperature: 37 to 41 degrees F.

Mean summer soil temperature: 44 to 47 degrees F.

Ochric epipedon thickness: 13 to 24 inches, includes the Oi, A, E1, and E2 horizons.

Depth to top of albic horizon: 2 to 5 inches measured from the mineral soil surface at the top of the A horizon.

Depth to base of cambic horizon: More than 60 inches measured from the mineral soil surface at the top of the A horizon.

Particle-size control section:

Clay content—12 to 18 percent.

Rock fragments—50 to 80 percent, dominantly cobbles and stones. Lithology of fragments is mainly quartzite.

A horizon:

Chroma—2 or 3, dry or moist.

Reaction—Moderately acid or slightly acid.

E horizons:

Chroma—2 or 3 moist.

Clay content—12 to 18 percent.

Rock fragments—50 to 80 percent, dominantly cobbles and stones.

Reaction—Strongly acid to slightly acid.

Other features—These horizons constitute both an albic horizon and part of the cambic horizon.

E and Bt horizon:

Chroma—2 or 3 moist.

Clay content—12 to 18 percent.

Rock fragments—50 to 80 percent, dominantly cobbles and stones.

Reaction—Strongly acid to slightly acid.

Lamellae—2 to 10 mm thick sandy loam or sandy clay loam lamellae are present, with cumulative thickness of 1 to 5 inches.

Keyhole series

(Fig. 74)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately rapid in the upper part and very rapid in the lower part

Runoff: Medium

Landform: Mountains

Parent material: Kind — Colluvium; Source — Quartzite

Slope range: 15 to 75 percent

Elevation: 9,400 to 11,650 feet

Mean annual precipitation: 24 to 37 inches

Mean annual air temperature: 35 to 39 degrees F.

Frost-free period: 30 to 50 days



Figure 74—Keyole soils have dark surface layers due to decomposing organic material. Soil development in the lower part is minimal.

Taxonomic class: Loamy-skeletal, mixed, active Xeric Haplocryepts

Typical pedon: Keyole extremely gravelly sandy loam, in an area of soil map unit 5290, forestland.

(Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 50 percent gravel, 20 percent cobbles, and 15 percent stones.

Oi—0 to 1 inch; slightly decomposed plant material (needles, twigs, and cones) from Engelmann's spruce and limber pine.

A—1 to 5 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine interstitial pores; 55 percent gravel, 15 percent cobbles, and 15 percent stones; neutral (pH 6.6); abrupt wavy boundary.

Bw—5 to 18 inches; light gray (10YR 7/2) extremely gravelly coarse sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine, and common medium and coarse roots; many very fine and fine interstitial pores; 55 percent gravel and 20 percent cobbles; neutral (pH 6.6); gradual wavy boundary.

2C—18 to 60 inches; light gray (10YR 7/2) gravel, brown (10YR 5/3) moist; sloughs readily when excavated; common very fine and fine roots; many very fine, fine, and medium interstitial pores; 75 percent gravel and 20 percent cobbles; neutral (pH 6.8).

Type location: White Pine County, Nevada; in Great Basin National Park about 0.4 mile west of Stella Lake; USGS Windy Peak 7.5 minute topographic quadrangle; 39 degrees, 00 minutes, 22 seconds north latitude and 114 degrees, 19 minutes, 38 seconds west longitude; UTM zone 11 731442e, 4320859n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime.

Mean annual soil temperature: 38 to 41 degrees F.

Mean summer soil temperature: 44 to 47 degrees F.

Depth to fragmental material: 18 to 24 inches.

Profile reaction: Slightly acid or neutral.

Particle-size control section:

Clay content—Averages 4 to 8 percent.

Rock fragment content—Averages 60 to 90 percent, mainly as gravel.

A horizon:

Value—5 through 7 dry.

Chroma—2 or 3, dry or moist.

Bw horizon:

Value—6 or 7 dry.

Chroma—2 through 4, dry or moist.

Texture—Coarse sandy loam or sandy loam,

Rock fragments—60 to 85 percent.

Structure—Subangular blocky or massive.

2C horizon:

Value—6 or 7 dry.

Chroma—2 or 3, dry or moist.

Rock fragments—85 to 95 percent total; 85 to 95 percent gravel and 0 to 20 percent cobbles.

Other features—Subhorizons in some pedons have thin layers of fine sand and silt-size rock flour on the tops of rock fragments.

Kious series

(Fig. 75)

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium through very high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Granite

Slope range: 30 to 75 percent

Elevation: 7,120 to 10,500 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days



Figure 75—Kious series consists of shallow soils forming over weathered granitic rock.

Taxonomic class: Loamy-skeletal, mixed, superactive, shallow Pachic Haplocryolls

Typical pedon: Kious extremely gravelly loamy coarse sand, in an area of soil map unit 5350, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 25 percent pebbles, 15 percent cobbles, and 5 percent stones.

- A1—0 to 2 inches; dark grayish brown (10YR 4/2) extremely gravelly loamy coarse sand, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 45 percent pebbles, 10 percent cobbles, and 5 percent stones; slightly acid (pH 6.2); abrupt smooth boundary.
- A2—2 to 9 inches; dark grayish brown (10YR 4/2) very gravelly loamy coarse sand, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine and medium, and few coarse roots; common very fine tubular and interstitial pores; 50 percent pebbles and 5 percent cobbles; slightly acid (pH 6.4); clear smooth boundary.
- A3—9 to 17 inches; grayish brown (10YR 5/2) very gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine and medium, and common coarse roots; common very fine tubular and interstitial pores; 45 percent pebbles and 10 percent cobbles; neutral (pH 6.6); clear wavy boundary.
- A4—17 to 19 inches; brown (10YR 5/3) extremely gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common very fine tubular and interstitial pores; 45 percent pebbles and 20 percent cobbles; neutral (pH 6.6); abrupt irregular boundary.

Cr—19 to 50 inches; weathered granite; with roots and fine-earth in fractures.

Type location: White Pine County, Nevada; in Great Basin National Park about 1 mile north of Shoshone Campground; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 56 minutes, 28 seconds north latitude and 114 degrees, 15 minutes, 25 seconds west longitude; UTM Zone 11 737743e, 4313814n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist; moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime.

Mean annual soil temperature: 40 to 45 degrees F.

Mean summer soil temperature: 47 to 50 degrees F.

Mollic epipedon thickness: 16 to 20 inches.

Depth to paralithic contact: 16 to 20 inches. The paralithic materials below the contact is weathered granite.

Depth to lithic material: 20 to 30 inches.

Reaction: Slightly acid or neutral, usually increasing with depth.

Particle-size control section:

Clay content—12 to 18 percent.

Rock fragments—50 to 80 percent, dominantly fine (2 to 5 mm diameter) gravel. Lithology of fragments is granitic rock such as quartz monzonite.

A1 and A2 horizons:

Value—4 or 5 dry, 2 or 3 moist; value 5 dry and 3 moist usually in the A2 horizon.

Organic matter content—2 to 4 percent.

A3 horizon and A4 horizon:

Chroma—2 or 3, dry or moist.

Clay content—12 to 18 percent.

Rock fragment content—50 to 80 percent.

Organic matter content—1 or 2 percent.

Lehmandow series

Depth class: Very deep

Drainage class: Poorly drained

Permeability: Very slow

Runoff: Very high

Landform: Stream terraces

Parent material: Kind — Alluvium over till; Source — Limestone, quartzite and granite

Slope range: 2 to 8 percent

Elevation: 7,380 to 9,020 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 39 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Loamy-skeletal, mixed, superactive, frigid Typic Endoaquolls

Typical pedon: Lehmandow loam, in an area of soil map unit 5434, rangeland. (Colors are for dry soil unless otherwise noted.)

A1—0 to 4 inches; dark gray (10YR 4/1) loam, very dark brown (10YR 2/2) moist; strong very fine subangular blocky structure parting to strong fine granular; slightly hard, friable, nonsticky and nonplastic; many very fine, and few fine roots; many very fine and common fine tubular and interstitial pores; slightly alkaline (pH 7.4); clear smooth boundary.

A2—4 to 10 inches; very dark grayish brown (10YR 3/2) clay loam, very dark brown (10YR 2/2) moist; strong coarse subangular blocky structure parting to strong fine subangular blocky; very hard, very firm, moderately sticky and moderately plastic; common very fine, and many fine and medium roots; few very fine, fine and medium tubular and interstitial pores; 5 percent gravel and 5 percent cobbles; neutral (pH 6.9); clear smooth boundary.

Cg1—10 to 24 inches; gray (10YR 6/1) very stony clay loam, dark gray (10YR 4/1) moist; strong coarse subangular blocky structure parting to strong medium subangular blocky; very hard, very firm, moderately sticky and moderately plastic; few very fine, common fine and medium roots; common very fine and fine, and few medium interstitial pores; common (10 percent) distinct fine irregular, light brown (7.5YR 6/4) masses of iron accumulation; 10 percent gravel, 15 percent cobbles, and 20 percent stones; slightly alkaline (pH 7.4); clear smooth boundary.

Cg2—24 to 45 inches; light gray (10YR 7/2) very stony clay loam, grayish brown (10YR 5/2) moist; strong coarse subangular blocky structure parting to strong medium subangular blocky; hard, firm, slightly sticky and slightly plastic; few very fine, common fine and medium roots; common very fine and fine, and few medium interstitial pores; many (25 percent) distinct medium irregular, light brown (7.5YR 6/4) masses of iron accumulation; 15 percent gravel, 10 percent cobbles, and 25 percent stones; slightly alkaline (pH 7.5); clear smooth boundary.

Cg3—45 to 60 inches; white (10YR 8/1) very stony clay loam, gray (10YR 6/1) moist; massive; hard, firm, moderately sticky and slightly plastic; few very fine, fine, and medium roots; common very fine and fine, and few medium interstitial pores; many (20 percent) distinct large irregular, light brown (7.5YR 6/4) masses of iron accumulation; 5 percent gravel, 10 percent cobbles, and 30 percent stones; slightly alkaline (pH 7.7); clear smooth boundary.

Type location: White Pine County, Nevada; in Great Basin National Park in Strawberry Creek drainage about 300 feet west of Blue Canyon; USGS Windy Peak 7.5 minute topographic quadrangle; 39 degrees, 3 minutes, 20 seconds north latitude and 114 degrees, 18 minutes, 21 seconds west longitude; UTM Zone 11, 733129e, 4326402n, NAD 83.

Range in Characteristics:

Soil moisture: Usually moist throughout the year below 40 inches; ground water has an upper boundary between 6 to 12 inches between March and May during normal years; Aquic soil moisture regime.

Mean annual soil temperature: 41 to 45 degrees F.

Mollic epipedon thickness: 10 to 24 inches.

Reaction: Neutral to slightly alkaline.

Particle-size control section:

Clay content—Averages 20 to 35 percent.

Rock fragments—Averages 35 to 60 percent, mainly cobbles and stones. Lithology of fragments is mainly quartzite.

A horizons:

Value—3 through 5 dry, 2 or 3 moist.

Chroma—1 or 2, dry or moist.

Organic matter content—2 to 4 percent.

Cg horizons:

Value—6 through 8 dry, 4 through 6 moist.

Chroma—1 or 2, dry or moist.

Texture—Loam or clay loam.

Clay content—20 to 35 percent.

Rock fragments—35 to 65 percent, dominantly cobbles and stones.

Redoximorphic features—Concentrations occur as common or many masses of iron accumulation.

Lemcave series

(Fig. 76)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately rapid

Runoff: Medium

Landform: Moraines and stream terraces

Parent material: Kind — Till and outwash; Source — Quartzite and minor amounts of granite

Slope range: 8 to 50 percent

Elevation: 6,820 to 9,400 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days



Figure 76—Lemcave soils formed in till, which has a high volume of rock fragments of various sizes.

Taxonomic class: Sandy-skeletal, mixed Oxyaquic Haplocrypts

Typical pedon: Lemcave extremely gravelly sandy loam, in an area of soil map unit 5311, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 25 percent gravel, 15 percent cobbles, 10 percent stones, and 5 percent boulders.

Oi—0 to 1 inch; slightly decomposed plant material composed of conifer needles; abrupt wavy boundary.

- A—1 to 3 inches; brown (10YR 5/3) extremely gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and few fine roots; many very fine interstitial pores; 50 percent gravel, 10 percent cobbles, and 5 percent stones; neutral (pH 6.8); abrupt smooth boundary.
- AE—3 to 8 inches; pale brown (10YR 6/3) extremely gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium, and few coarse roots; common very fine tubular pores; 50 percent gravel, 15 percent cobbles, and 5 percent stones; neutral (pH 6.8); clear smooth boundary.
- E1—8 to 14 inches; light gray (10YR 7/2) extremely cobbly coarse sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium, and coarse roots; many very fine interstitial pores; 40 percent gravel, 25 percent cobbles, and 5 percent stones; neutral (pH 6.6); clear wavy boundary.
- E2—14 to 30 inches; very pale brown (10YR 7/3) extremely cobbly loamy coarse sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine, common fine and medium roots; many very fine interstitial pores; 45 percent gravel, 25 percent cobbles, and 5 percent stones; slightly acid (pH 6.2); clear wavy boundary.
- E and Bt—30 to 61 inches; 90 percent very pale brown (10YR 7/3) extremely cobbly loamy coarse sand, brown (10YR 5/3) moist (E part), with 10 percent 5 to 20 mm thick lamellae of light yellowish brown (10YR 6/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist (Bt part); massive; soft, very friable nonsticky and nonplastic; 40 percent gravel, 25 percent cobbles, and 5 percent stones; strongly acid (pH 5.5).

Type location: White Pine County, Nevada; in Great Basin National Park about 1,500 feet south of Dead Lake; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 55 minutes, 57 seconds north latitude and 114 degrees, 16 minutes, 21 seconds west longitude; UTM Zone 11, 736423e, 4312818n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; snow covered from November through April; upper part is saturated for about 20 to 30 consecutive days during snowmelt; Xeric soil moisture regime.

Mean annual soil temperature: 40 to 45 degrees F.

Mean summer soil temperature: 44 to 47 degrees F.

Mean winter temperature: 32 to 36 degrees F.

Ochric epipedon thickness: 18 to 35 inches, includes the Oi, A, AE, E1, and E2 horizons.

Particle-size control section:

Clay content—Averages 4 to 12 percent.

Rock fragment content—Averages 50 to 90 percent. Lithology of fragments is mainly quartzite.

A and AE horizons:

Value—5 or 6 dry, 3 or 4 moist.

Chroma—2 or 3, dry or moist.

Reaction—Slightly acid or neutral.

E horizons:

Value—6 or 7 dry, 4 or 5 moist.

Clay content—6 to 18 percent.

Rock fragments—50 to 90 percent.

Reaction—Slightly acid or neutral.

E and Bt horizon:

Clay content—3 to 10 percent.

Lamellae—5 to 20 mm thick lamellae of sandy clay loam or sandy loam and clay bridging of sand grains occurs below 24 inches from the soil surface. Total thickness of the lamellae is less than 3 inches or less than 10 percent of the thickness of overlying horizons.

Reaction—Strongly acid through slightly acid.

Linpeak series

Depth class: Very deep

Drainage class: Moderately well drained

Permeability: Moderate

Runoff: High

Landform: Mountains

Parent material: Kind — Colluvium; Source — Limestone and calcareous shale

Slope range: 15 to 50 percent

Elevation: 8,000 to 11,250 feet

Mean annual precipitation: 24 to 37 inches

Mean annual air temperature: 35 to 39 degrees F.

Frost-free period: 30 to 50 days

Taxonomic class: Loamy-skeletal, carbonatic Xeric Calcicrypts

Typical pedon: Linpeak gravelly loam, in an area of soil map unit 5340, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 30 percent gravel.

Oi—0 to 2 inches; slightly decomposed plant material composed of needles, twigs, and cones from Engelmann's spruce; abrupt smooth boundary.

A—2 to 3 inches; light brownish gray (10YR 6/2) gravelly loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular and few very fine interstitial pores; 25 percent gravel; moderately acid (pH 5.6); abrupt smooth boundary.

Bw1—3 to 14 inches; light yellowish brown (10YR 6/4) and light gray (2.5Y 7/2) very gravelly loam, dark yellowish brown (10YR 4/4) and light brownish gray (2.5Y 6/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; slightly sticky and slightly plastic; common very fine through coarse roots; common very fine tubular and interstitial pores; common large prominent yellowish red (5YR 4/6) moist masses of iron accumulation; 45 percent gravel and 5 percent cobbles; neutral (pH 7.1); clear wavy boundary.

Bw2—14 to 32 inches; light yellowish brown (10YR 6/4) very gravelly loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, very friable, moderately sticky and slightly plastic; few very fine through coarse roots, with many very fine roots in pockets; common very fine tubular and interstitial pores; 55 percent gravel; strongly effervescent; 5 percent calcium carbonate equivalent; moderately alkaline (pH 8.0); abrupt wavy boundary.

Bk—32 to 62 inches; pale yellow (5Y 7/3) extremely gravelly loam, olive (5Y 5/3) moist; massive; slightly hard, very friable; moderately sticky and slightly plastic; few very fine and fine roots, many very fine roots in pockets; many very fine interstitial and few very fine tubular pores; 70 percent gravel, with discontinuous strata ranging from 50 to 90 percent gravel; strongly effervescent; secondary calcium carbonate concretions on bottoms of rock fragments; 32 percent calcium carbonate equivalent; moderately alkaline (pH 8.2).

Type location: White Pine County, Nevada; in Great Basin National Park about 0.75 mile northeast of Lincoln Peak; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 53 minutes, 22

seconds north latitude and 114 degrees, 17 minutes, 23 seconds west longitude; UTM Zone 11 735072e 4307994n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; snow covered from November through April; upper part is saturated for less than 20 days during snowmelt in April and/or May. Water appears to move laterally in the lower part of the profile in spring and early summer; Xeric soil moisture regime.

Mean annual soil temperature: 38 to 41 degrees F.

Mean summer soil temperature: 44 to 47 degrees F.

Depth to base of cambic horizon: 15 to 32 inches.

Depth to calcic horizon: 30 to 40 inches.

Particle-size control section:

Clay content—Averages 12 to 18 percent.

Rock fragment content—50 to 80 percent, mainly gravel. Lithology of fragments is mainly limestone.

A horizon:

Value—5 or 6 dry, 3 through 5 moist.

Chroma—2 or 3, dry or moist.

Reaction—Moderately acid or slightly acid.

Bw1 horizon:

Hue—10YR or 2.5Y.

Value—6 or 7 dry, 4 through 6 moist.

Chroma—2 through 6, dry or moist.

Clay content—18 to 27 percent.

Rock fragments—50 to 80 percent, mainly gravel.

Reaction—Moderately acid through neutral.

Redoximorphic features—Commonly occur as coarse concentrations of iron with hue of 5YR or 7.5YR.

Bw2 horizon:

Hue—10YR or 2.5Y.

Value—6 or 7 dry, 4 or 5, moist.

Chroma—2 through 6, dry or moist.

Clay content—18 to 27 percent.

Rock fragments—50 to 80 percent, mainly gravel.

Reaction—Neutral through moderately alkaline.

Effervescence—Slightly effervescent or strongly effervescent.

Calcium carbonate equivalent—40 to 55 percent in the less than 20 mm fraction, 5 to 30 percent calcium carbonate equivalent in the less than 2 mm fraction.

Bk horizon:

Hue—10YR through 5Y.

Value—6 or 7 dry.

Chroma—3 or 4, dry or moist.

Reaction—Slightly alkaline or moderately alkaline.

Clay content—5 to 15 percent.

Rock fragments—50 to 85 percent, mainly gravel.

Effervescence—Strongly effervescent or violently effervescent.

Calcium carbonate equivalent—40 to 55 percent in the less than 20 mm fraction, 25 to 40 percent calcium carbonate equivalent in the less than 2 mm fraction.

Lodar series*Depth class:* Shallow*Drainage class:* Well drained or somewhat excessively drained*Permeability:* Moderate*Runoff:* Medium through very high*Landform:* Mountains*Parent material:* Residuum and colluvium; Source - Limestone*Slope range:* 15 to 50 percent*Elevation:* 7,380 to 8,600 feet*Mean annual precipitation:* 12 to 16 inches*Mean annual air temperature:* 45 to 52 degrees F*Frost-free period:* 90 to 110 days**Taxonomic class:** Loamy-skeletal, carbonatic, mesic Lithic Calcixerolls**Typical pedon:** Lodar very gravelly loam, in the soil survey of White Pine County, Nevada, East Part, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with approximately 45 percent pebbles, 15 percent cobbles, and 1 percent stones.

A1—0 to 3 inches; brown (10YR 5/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine and few medium roots; common fine tubular pores; 35 percent pebbles; slightly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.

A2—3 to 7 inches; grayish brown (10YR 5/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine and medium roots; common fine tubular pores; few faint secondary calcium carbonate coats on bottom of rock fragments; 50 percent pebbles and 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk1—7 to 10 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine, medium, and coarse roots; few fine tubular pores; common rounded secondary calcium carbonate masses; 35 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary.

Bk2—10 to 19 inches; light gray (10YR 7/2) extremely gravelly loam, grayish brown (10YR 5/2) moist; massive; soft, very friable, slightly sticky and nonplastic; common fine, medium, and coarse roots; few fine and medium tubular pores; many medium masses of secondary calcium carbonate; common distinct secondary calcium carbonate pendants on bottom of rock fragments, and many distinct continuous secondary calcium carbonate coats around rock fragments; 70 percent pebbles; moderately alkaline (pH 8.2); abrupt wavy boundary.

R—19 inches; limestone.

Type location: White Pine County, Nevada; approximately 9.5 miles east of Tippet Ranch on the Pleasant Valley road and 1,800 feet south of the cattle guard along the fence line; about 2,155 feet north and 2,275 feet east of southwest corner of section 16, T.22 N., R.69 E.; USGS Tippet Canyon 7.5 minute topographic quadrangle; 39 degrees, 46 minutes, 54 seconds north latitude and 114 degrees, 11 minutes, 04 seconds west longitude; UTM Zone 11, 741116e, 4407317n, NAD83.

Range in Characteristics:

Soil moisture: The soils are dry for 80 to 100 consecutive days in the moisture control section within the 3 months after June 21. The soil moisture regime is xeric bordering on aridic.

Mean annual soil temperature: 8 to 12 degrees C.

The thickness of the mollic epipedon: 18 to 25 cm.

Depth to the calcic horizon: 18 to 25 cm.

Depth to bedrock: 25 to 50 cm.

Calcium carbonate equivalent: 40 to 80 percent, including those in coarse fragments of less than 20 millimeter size, between 25 cm and bedrock.

Particle-size control section:

Clay content—is 18 to 27 percent.

Rock fragment content—20 to 80 percent by volume but averages more than 35 percent between 10 inches and bedrock.

A horizons:

Hue—10YR or 7.5YR.

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Reaction—Slightly alkaline or moderately alkaline.

Calcium carbonate equivalent—1 to 45 percent of the less than 20 mm fraction. When the CCE exceeds 40 percent the color value moist is 5 or less.

Effervescence—Slightly effervescent or strongly effervescent.

Bk horizon:

Hue—10YR or 7.5YR.

Value—5 to 7 dry, 4 to 6 moist.

Chroma—2 or 4, dry or moist.

Textures—Very gravelly loam, very cobbly loam, very gravelly sandy loam, very cobbly sandy loam or extremely gravelly loam.

Consistence—Soft or slightly hard, dry, very friable or friable, moist, nonsticky or slightly sticky and nonplastic to moderately plastic, wet.

Reaction—Moderately alkaline or strongly alkaline.

Calcium carbonate equivalent—40 to 80 percent of the less than 20 mm fraction, and 30 to 40 percent in the less than 2 mm fraction.

Other features—Secondary calcium carbonate occurs as concentrations or pendants on rock fragments and as irregular masses.

Logring series

Depth class: Shallow and very shallow

Drainage class: Well drained

Permeability: Moderate

Runoff: High to very high

Landform: Mountains

Parent material: Kind -Residuum and colluvium; Source - Limestone

Slope range: 30 to 75 percent

Elevation: 6,730 to 9,090 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 45 to 52 degrees F.

Frost-free period: 80 to 110 days

Taxonomic class: Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents

Typical pedon: Logring extremely gravelly loam, in the soil survey of White Pine County, Nevada, East Part, forestland. (A representative pedon in Great Basin National Park is located in map unit 2103 at latitude 38.9195 degrees N and longitude 114.1704 degrees W. Colors are for dry soil unless otherwise noted.) The surface is covered with approximately 60 percent pebbles and 10 percent cobbles.

A—0 to 3 inches; brown (10YR 5/3) extremely gravelly loam, dark brown (10YR 3/3) moist; moderate medium platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine interstitial pores; 65 percent pebbles; strongly effervescent; slightly alkaline (pH 7.5); clear smooth boundary.

Bk1—3 to 6 inches; pale brown (10YR 6/3) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine interstitial pores; 35 percent pebbles; few distinct secondary calcium carbonate coats on rock fragments; strongly effervescent; slightly alkaline (pH 7.4); clear smooth boundary.

Bk2—6 to 10 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine interstitial pores; 45 percent pebbles; few distinct secondary calcium carbonate pendants on rock fragments; strongly effervescent; slightly alkaline (pH 7.4); abrupt irregular boundary.

R—10 inches; hard fractured limestone bedrock.

Type location: White Pine County, Nevada; approximately 400 feet south of Marble Wash Road in the Snake Range; about 300 feet south and 1,200 feet east of the northwest corner of section 5, T.18 N., R.69 E.; USGS Mormon Jack Pass 7.5 minute topographic quadrangle; 39 degrees, 27 minutes, 33 seconds north latitude and 114 degrees, 14 minutes, 27 seconds west longitude; UTM Zone 11, 737387e, 4371367n, NAD83.

Range in Characteristics:

Soil moisture: Usually dry, moist in winter and spring months, dry summer and fall except for 10 to 20 days cumulative between July and October due to convection storms. Aridic bordering on xeric soil moisture regime.

Soil temperature: 47 to 50 degrees F.

Reaction: Slightly alkaline to strongly alkaline.

Carbonates: Strongly effervescent to violently effervescent throughout, with 40 to 60 percent calcium carbonate equivalent in the less than 20 mm fraction and 15 to 40 percent in the less than 2 mm fraction. Accumulation of secondary carbonates is less than 5 percent in horizons more than 4 inches thick.

Organic carbon: 1.0 to 1.5 percent in upper 7 inches.

Depth to bedrock: 7 to 14 inches.

Control section:

Clay content—8 to 18 percent.

Rock fragments—35 to 60 percent, mainly cobbles and pebbles.

A horizon:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 through 4, dry or moist.

Bk horizons:

Chroma—3 or 4, dry or moist.

Texture—loam, fine sandy loam, or sandy loam.

Structure—Weak fine or medium subangular blocky.

Majorsplace series

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderately slow

Runoff: Medium through very high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Quartzite with minor amounts of calcareous loess

Slope range: 8 to 30 percent

Elevation: 6,360 to 7,640 feet

Mean annual precipitation: 10 to 16 inches

Mean annual air temperature: 43 to 45 degrees F.

Frost-free period: 70 to 100 days

Taxonomic class: Loamy-skeletal, mixed, superactive, frigid Lithic Argixerolls

Typical pedon: Majorsplace very gravelly loam, in the soil survey of White Pine County, Nevada, East Part, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with approximately 40 percent gravel, 20 percent cobbles, and 10 percent stones.

A1—0 to 3 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure parting to moderate medium granular; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine and fine, and few medium interstitial and tubular pores; 35 percent gravel and 20 percent cobbles; finely disseminated calcium carbonate; 3 percent calcium carbonate equivalent; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

A2—3 to 7 inches; brown (10YR 5/3) extremely cobbly loam, dark yellowish brown (10YR 3/4) moist; strong medium subangular blocky structure parting to strong medium granular; soft, very friable, slightly sticky and nonplastic; many very fine, common fine, and few medium roots; common very fine, few fine and medium interstitial and tubular pores; 35 percent gravel, 25 percent cobbles, and 2 percent stones; finely disseminated calcium carbonate; 5 percent calcium carbonate equivalent; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

Btk—7 to 13 inches; brown (7.5YR 5/4) extremely cobbly clay loam, dark brown (7.5YR 3/4) moist; strong medium subangular blocky structure parting to weak fine subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; common very fine, and few fine and medium roots; few very fine, fine, and medium interstitial and tubular pores; common faint clay films on faces of peds; finely disseminated secondary calcium carbonate; common (5 percent) secondary calcium carbonate concretions on bottom of rock fragments; 12 percent calcium carbonate equivalent; violently effervescent; 35 percent gravel and 30 percent cobbles; strongly alkaline (pH 8.6); clear smooth boundary.

Bk—13 to 18 inches; light brown (7.5YR 6/3) extremely cobbly loam, brown (7.5YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine, fine, medium, and coarse interstitial pores; finely disseminated secondary calcium carbonate; common secondary calcium carbonate concretions around rock fragments and many (20 percent) secondary calcium carbonate concretions on bottom of rock fragments; 23 percent calcium carbonate equivalent; violently effervescent; 35 percent gravel and 30 percent cobbles; strongly alkaline (pH 8.9); abrupt smooth boundary.

R—18 inches; indurated quartzite bedrock.

Type location: White Pine County, Nevada; about 4 miles north of Majors Place, (junction Hwy 93 and Hwy 50) and about 1 mile south of Cooper Canyon, about 400 feet southwest from the end of the jeep trail; USGS Majors Place 7.5 minute topographic quadrangle; 39 degrees, 05 minutes, 2.2 seconds north latitude and 114 degrees, 34 minutes, 7.4 seconds west longitude; UTM Zone 11, 710294e, 4328907n, NAD 83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime bordering aridic.

Soil temperature: 44 to 47 degrees F.

Mollic epipedon thickness: 7 inches when mixed, to 10 inches thick.

Argillic horizon thickness: 5 to 16 inches.

Depth to lithic contact: 14 to 20 inches.

Particle-size control section:

Clay content—Averages 27 to 35 percent.

Rock fragment content—Averages 50 to 70 percent, mainly cobbles, lithology mainly quartzite.

A horizons:

Value—5 or 6 dry, 3 or 4 moist.

Chroma—3 or 4, dry or moist.

Calcium carbonate equivalent—0 to 10 percent.

Effervescence—Noneffervescent to strongly effervescent.

Reaction—Neutral to strongly alkaline.

Organic matter—2 to 4 percent.

Btk horizons:

Hue—10YR or 7.5YR.

Value—5 or 6 dry, 3 or 4 moist.

Chroma—3 through 6, dry or moist.

Clay content—27 to 35 percent.

Rock fragments—50 to 70 percent.

Calcium carbonate equivalent—: 10 to 15 percent.

Effervescence—Slightly effervescent to violently effervescent.

Reaction—Slightly alkaline to strongly alkaline.

Organic matter—1 to 2 percent.

Bk horizon:

Hue—10YR or 7.5YR.

Value—5 or 6 dry, 4 or 5 moist.

Chroma—3 or 4, dry or moist.

Clay content—20 to 27 percent.

Rock fragments—60 to 80 percent, mainly cobbles.

Calcium carbonate equivalent—15 to 25 percent.

Reaction—Strongly alkaline to very strongly alkaline.

Organic matter—0.2 to 0.8 percent.

Other features—This horizon is too thin to meet calcic horizon criteria.

Millan series

(Fig. 77)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately slow

Runoff: Medium to very high

Landform: Fan remnants

Parent material: Kind — Alluvium; Source — Quartzite with minor amounts of limestone and granite

Slope range: 15 to 50 percent slopes

Elevation: 6,590 to 7,510 feet

Mean annual precipitation: 12 to 16 inches

Mean annual air temperature: 43 to 45 degrees F.

Frost-free period: 70 to 100 days



Figure 77—The Millan soil has a reddish zone of clay accumulation at about 20 cm.

Taxonomic class: Loamy-skeletal, mixed, superactive, frigid Aridic Argixerolls

Typical pedon: Millan very gravelly loam, in map unit 1700 in the soil survey of Snake Range Area, Nevada, about 2,040 feet north of the Great Basin National Park boundary. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 75 percent gravel and less than 1 percent cobbles and stones.

A1—0 to 3 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 35 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.

A2—3 to 6 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine, common fine and medium, and few coarse roots; many very fine interstitial pores; 45 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.

Bt—6 to 10 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; many very fine, common fine, and few medium and coarse roots; common very fine tubular and interstitial pores; few faint clay films on faces of peds; 45 percent pebbles; neutral (pH 7.2); clear wavy boundary.

Btk—10 to 16 inches; pale brown (10YR 6/3) extremely gravelly clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine and fine, and few medium roots; common very fine tubular and interstitial pores;

common distinct clay films on faces of peds; 15 percent secondary calcium carbonate concretions on the bottom of rock fragments; 60 percent pebbles; neutral (pH 7.3); clear wavy boundary.

Bk1—16 to 29 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and nonplastic; common very fine, few fine, medium and coarse roots; common very fine tubular and interstitial pores; 10 percent secondary calcium carbonate concretions on the bottom of rock fragments; 70 percent pebbles and 5 percent cobbles; neutral (pH 7.3); clear wavy boundary.

Bk2—29 to 60 inches; very pale brown (10YR 7/3) extremely gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine, and few fine and medium roots; common very fine tubular and interstitial pores; 70 percent pebbles and 5 percent cobbles; 5 percent secondary calcium carbonate concretions on the bottom of rock fragments; slightly alkaline (pH 7.4).

Type location: White Pine County, Nevada; about 0.5 mile south of Mill Creek, and 0.25 mile east of Great Basin National Park; about 2,000 feet north and 1,700 feet east of the southwest corner of section 33 T.14 N., R.69 E; USGS Lehman Caves 7.5 minute topographic quadrangle; 39 degrees, 02 minutes, 29 seconds north latitude and 114 degrees, 14 minutes, 18 seconds west longitude; UTM zone 11 739018e, 4324993n, NAD83.

Range in Characteristics:

Soil moisture: Usually dry; moist in winter and spring, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Aridic bordering on xeric soil moisture regime.

Soil temperature: 44 to 47 degrees F.

Mollic epipedon thickness: 10 to 16 inches, including the upper part of the argillic horizon.

Depth to the base of Bt horizon: 10 to 20 inches.

Particle-size control section:

Percent clay—27 to 35 percent.

Rock fragments—50 to 80 percent, dominantly pebbles.

A horizon:

Chroma—2 or 3, dry or moist.

Bt horizon:

Value—5 or 6 dry; 3 through 5 moist; with 5 dry and 3 moist occurring in upper part only.

Chroma—2 or 3, dry or moist.

Clay content—27 to 35 percent.

Rock fragments—Averages 50 to 80 percent, with individual horizons ranging from 40 to 80 percent, dominantly pebbles.

Bk horizons:

Value—6 or 7 dry; 4 or 5 moist.

Chroma—2 or 3, dry moist.

Texture—Sandy loam or loam.

Clay content—Averages 12 to 18 percent.

Rock fragments—50 to 80 percent, dominantly pebbles.

Reaction—Neutral through moderately alkaline.

Effervescence—Non-effervescent or slightly effervescent matrix.

Calcium carbonate equivalent—0 to 1 percent in less than 2 mm fraction; some pedons have up to 5 percent in Bk horizons.

Monarch series

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderate

Runoff: High to very high

Landform: Mountains

Parent material: Kind - Residuum and colluvium; Source - Limestone, inter-bedded shale, and fanglomerate

Slope range: 30 to 75 percent

Elevation: 7,380 to 8,600 feet

Mean annual precipitation: 12 to 16 inches

Mean annual air temperature: 43 to 45 degrees F.

Frost-free period: 70 to 90 days

Taxonomic class: Loamy-skeletal, carbonatic, frigid Lithic Calcixerolls

Typical pedon: Monarch very cobbly sandy loam, in the soil survey of White Pine County, Nevada, East Part, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 30 percent pebbles, 15 percent cobbles, and 1 percent stones.

A1—0 to 2 inches; dark grayish brown (10YR 4/2) very cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 20 percent pebbles and 20 percent cobbles; slightly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

A2—2 to 6 inches; dark grayish brown (10YR 4/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine, fine, common medium and few coarse roots; many very fine interstitial pores; common distinct secondary calcium carbonate coats and few distinct secondary calcium carbonate pendants on the bottom of rock fragments; 25 percent pebbles and 15 percent cobbles; strongly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary.

Bk1—6 to 10 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine, fine, medium and coarse roots; many very fine interstitial pores; many distinct secondary calcium carbonate coats around rock fragments and few distinct secondary calcium carbonate pendants on the bottom of rock fragments; 50 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

Bk2—10 to 17 inches; light gray (10YR 7/2) very gravelly loam, grayish brown (10YR 5/2) moist; massive; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; many distinct secondary calcium carbonate coats around rock fragments and common distinct secondary calcium carbonate pendants on the bottom of rock fragments; 50 percent pebbles and 5 percent cobbles; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

R—17 inches; hard fractured limestone.

Type location: White Pine County, Nevada; approximately 1 mile south-southeast of the intersection of the Blue Mass scenic area road and Pleasant Valley road; about 25 feet west and 175 feet north of the southeast corner of section 33, T.22 N., R.69 E.; USGS Blue Mass Canyon 7.5 minute topographic quadrangle; 39 degrees, 43 minutes, 55 seconds north latitude and 114 degrees, 10 minutes, 22 seconds west longitude; UTM Zone 11, 742290e, 4401829n, NAD83.

Range in Characteristics:

Soil moisture: Usually dry, moist in winter and spring months, dry summer and fall, except for 10 to 20 cumulative days between July and October due to convection storms. Xeric bordering on aridic soil moisture regime.

Soil temperature: 44 to 47 degrees F.

Mollic epipedon thickness: 10 to 20 inches thick, includes all or part of the Bk horizon.

Depth to bedrock: 14 to 20 inches.

Depth to calcic horizon: 6 to 12 inches.

Calcium carbonate equivalent of the less than 2mm fraction: 20 to 35 percent.

Calcium carbonate equivalent of the less than 20mm fraction: 40 to 80 percent.

Particle-size control section:

Clay content—12 to 18 percent.

Rock fragments—35 to 60 percent, mainly limestone pebbles with up to 15 percent cobbles.

A horizons:

Hue—10YR or 7.5YR.

Value—3 through 5 dry, 2 or 3 moist

Chroma—1 through 3, dry or moist.

Calcium carbonate equivalent of the less than 2mm fraction—5 to 15 percent.

Effervescence—Slightly effervescent to violently effervescent.

Bk horizons:

Hue—10YR, 7.5YR, 5YR.

Value—4 through 7 dry; 2 through 5 moist.

Chroma—2 through 5, dry or moist.

Texture—Loam, fine sandy loam.

Structure—Massive, fine, or medium subangular blocky.

Consistence—Soft or slightly hard dry, very friable or friable moist, nonplastic or slightly plastic.

Rock fragments—35 to 60 percent.

Calcium carbonates—Common to many coating and pendants on rocks fragments.

Effervescence—Strongly effervescent to violently effervescent.

Reaction—Moderately alkaline or strongly alkaline.

Muiral series

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Moderate

Runoff: High

Landform: Mountains

Parent material: Kind - Residuum and colluvium; Source - limestone and dolomite

Slope range: 15 to 75 percent

Elevation: 7,810 to 9,940 feet

Mean annual precipitation: 14 to 18 inches

Mean annual air temperature: 36 to 43 degrees F.

Frost-free period: 50 to 70 days

Taxonomic class: Loamy-skeletal, mixed, superactive Calcic Haplocrypts

Typical pedon: Muiral gravelly loam, in the soil survey of White Pine County, Nevada, East Part, forestland. (Colors are for air-dry soil unless otherwise noted.)

Oi—0 to 1 inches; slightly decomposed white fir needles.

Oe—1 to 2 inches; moderately decomposed white fir needles.

A—2 to 6 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; many very fine and fine interstitial pores; 15 percent pebbles; slightly effervescent; slightly acid (pH 6.4); clear wavy boundary.

Bw—6 to 18 inches; brown (10YR 5/3) very gravelly silt loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, moderately sticky and slightly plastic; few fine, coarse and many medium roots; many fine and medium tubular pores; 55 percent pebbles; slightly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.

Bk1—18 to 36 inches; brown (10YR 5/3) extremely gravelly silt loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine, medium and coarse roots; common fine and medium tubular pores; few distinct secondary calcium carbonate coats on rock fragments; 50 percent pebbles and 10 percent cobbles; slightly effervescent; slightly alkaline (pH 7.6); abrupt wavy boundary.

Bk2—36 to 39 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common medium interstitial pores; few distinct secondary calcium carbonate coats on rock fragments; 60 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary.

R—39 inches; hard limestone.

Type location: White Pine County, Nevada; approximately 3.5 miles northwest of Tippet in the Antelope Range; about 650 feet north and 1,220 feet west of the southeast corner of section 32 T.24 N., R.67 E.; USGS Baldy Peak 7.5 minute topographic quadrangle; 39 degrees, 54 minutes, 29 seconds north latitude and 114 degrees, 25 minutes, 18 seconds west longitude; UTM Zone 11, 720394e, 4420735n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter and spring, dry from middle through late summer; xeric moisture regime.

Soil temperature: 38 to 45 degrees F.

Summer soil temperature: 43 to 46 degrees F.

Ochric epipedon thickness: 7 to 12 inches; includes the Oi, Oe, A1, and A2 horizons.

Depth to bedrock: 20 to 40 inches to a lithic contact measured from the mineral soil surface.

Particle-size control section:

Clay content—12 to 18 percent.

Rock fragments—35 to 60 percent, with 25 to 55 percent pebbles and 10 to 20 percent cobbles and stones. Lithology of fragments is sedimentary rocks such as limestone, dolomite, and hard siltstone.

A horizon:

Value—4 through 6 dry, 2 through 4 moist; lighter than 5 dry and 3 moist when the upper 7 inches of the mineral soil is mixed.

Reaction—Moderately acid or slightly acid.

Effervescence—None to slightly effervescent.

Bw and Bk horizons:

Chroma—3 or 4, dry or moist.

Texture—Loam, silt loam or sandy loam.

Structure—Weak or moderate, fine or medium subangular blocky or massive.

Rock fragments—40 to 60 percent pebbles and cobbles. Texture modifiers are very gravelly or extremely gravelly.

Reaction—Slightly acid through moderately alkaline.

Calcium carbonate equivalent—0 to 5 percent.

Effervescence—None to slight.

Noski series

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderately rapid

Runoff: Medium through very high

Landform: Fan remnants

Parent material: Kind — Residuum and colluvium; Source — Fanglomerate

Slope range: 8 to 75 percent slopes

Elevation: 6,460 to 7,580 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 39 to 43 degrees F.

Frost-free period: 40 to 70 days

Taxonomic class: Loamy-skeletal, carbonatic, frigid Lithic Calcixerolls

Typical pedon: Noski gravelly loam, in the soil survey of Snake Range Area, Nevada, rangeland, about 5 miles south of Great Basin National Park. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with approximately 50 percent gravel, 10 percent cobbles, and 5 percent stones. The biological crust cover consists of 2 percent cyanobacteria, 2 percent lichens and 1 percent moss

A—0 to 2 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; few very fine and medium and common fine roots; few very fine and medium, and common fine tubular and interstitial pores; 18 percent calcium carbonate equivalent; 30 percent gravel; violently effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

ABk—2 to 7 inches; brown (10YR 5/3) very gravelly fine sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine, many fine, and few medium roots; common very fine and fine, and few medium tubular and interstitial pores; common distinct (5 percent) secondary calcium carbonate concretions around rock fragments; 23 percent calcium carbonate equivalent; 40 percent gravel and 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.3); clear smooth boundary.

Bk1—7 to 11 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine, and few medium and coarse roots; few very fine and fine, and common medium tubular and interstitial pores; finely disseminated calcium carbonate; common distinct (15 percent) secondary calcium carbonate concretions around rock fragments and common distinct (10 percent) secondary calcium carbonate concretions on bottom of rock fragments forming 1 mm pendants; 44 percent calcium carbonate equivalent; 50 percent gravel and 5 percent cobbles; violently effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

Bk2—11 to 15 inches; very pale brown (10YR 8/2) extremely gravelly sandy loam, light gray (10YR 7/2) moist; strong thick platy structure; very hard, extremely firm, nonsticky and nonplastic; few very fine and fine roots; common very fine, and few fine interstitial pores; finely disseminated calcium carbonate; many prominent (30 percent) secondary calcium carbonate concretions around rock fragments and common prominent (10 percent) secondary calcium carbonate concretions on bottom of rock fragments forming 2 mm pendants; 52 percent calcium carbonate equivalent; 60 percent gravel and 10 percent cobbles; violently effervescent; strongly alkaline (pH 8.5).

R—15 inches; very pale brown (10YR 8/2) indurated fanglomerate, very pale brown (10YR 7/3) moist.

Type location: White Pine County, Nevada; in the Snake Range, about 1.5 miles east of Big Spring Wash and 0.3 mile east of a jeep trail, which is now in the Highland Ridge Wilderness Area; USGS Big Spring 7.5 minute topographic quadrangle; 38 degrees, 44 minutes, 45 seconds north latitude and 114 degrees, 13 minutes, 34 seconds west longitude; UTM zone 11, 0741073e, 4292233n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime bordering on Aridic.

Mean annual soil temperature: 42 to 45 degrees F.

Mollic epipedon thickness: 7 to 12 inches.

Depth to lithic contact: 14 to 20 inches.

Depth to calcic horizon: 7 to 12 inches.

Thickness of the calcic horizon: 6 to 12 inches.

Particle-size control section:

Clay content—Averages 12 to 18 percent.

Rock fragments—Averages 50 to 75 percent mainly gravel. Lithology of the fragments is mainly limestone.

A and ABk horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Organic matter content—1 to 3 percent.

Calcium carbonate equivalent—15 to 30 percent.

Effervescence—Strongly effervescent or violently effervescent.

Reaction—Slightly alkaline to strongly alkaline.

Bk horizons:

Value—5 through 8 dry, 5 through 7 moist.

Chroma—2 through 4, dry and moist.

Texture—Sandy loam or fine sandy loam.

Clay content—12 to 18 percent.

Rock fragments—50 to 75 percent, mainly as gravel.

Structure—Weak to moderate, fine or medium subangular blocky or platy in the Bk2.

Calcium carbonate equivalent—40 to 60 percent in the finer fraction.

Secondary calcium carbonates—Common to many (10 to 40 percent) secondary calcium carbonate concretions around and on the bottom of rock fragments, increasing with depth.

Reaction—Moderately alkaline to very strongly alkaline.

Osditch series

(Fig. 78)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Runoff: High

Landform: Mountains

Parent material: Kind — Colluvium; Source — Quartzite and argillite

Slope range: 30 to 75 percent

Elevation: 7,380 to 10,170 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Loamy-skeletal, mixed, superactive Lamellic Haplocrypts



Figure 78—Osditch series, a forest soil, has a heavily leached zone below about 17 cm, resulting in pale soil colors.

Typical pedon: Osditch extremely stony loam, in an area of soil map unit 5292, forestland. (Colors are for dry soil unless otherwise noted.)

- Oi—0 to 1 inch; slightly decomposed plant material composed of needles, cones and twigs from white fir, Douglas-fir, and ponderosa pine; abrupt smooth boundary.
- A—1 to 3 inches; brown (10YR 5/3) extremely stony loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine tubular and interstitial pores; 20 percent pebbles, 20 percent cobbles, and 30 percent stones; neutral (pH 6.6); abrupt wavy boundary.
- E1—3 to 9 inches; light brownish gray (10YR 6/2) extremely cobbly loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine, fine and medium roots; common very fine tubular pores; 25 percent pebbles, 30 percent cobbles, and 15 percent stones; slightly acid (pH 6.4); clear wavy boundary.
- E2—9 to 18 inches; light gray (10YR 7/2) extremely cobbly sandy loam, grayish brown (10YR 5/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium and coarse roots; common very fine tubular and interstitial pores; 25 percent pebbles, 35 percent cobbles, and 15 percent stones; slightly acid (pH 6.4); clear wavy boundary.
- E and Bt1—18 to 31 inches; 95 percent light gray (10YR 7/2) extremely stony sandy loam, brown (10YR 5/3) moist (E part), with 5 percent pockets and lamellae of light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist (Bt part); massive; slightly hard, very friable, slightly sticky and nonplastic; many very fine and common fine and medium roots; common very fine interstitial, and few

very fine tubular pores; 30 percent pebbles, 25 percent cobbles, and 20 percent stones; slightly acid (pH 6.2); gradual wavy boundary.

E and Bt2—31 to 60 inches; 90 percent light gray (10YR 7/2) extremely stony sandy loam, brown (10YR 5/3) moist (E part), with 10 percent pockets and lamellae of light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist (Bt part); massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine, and few medium roots; common very fine interstitial and few very fine tubular pores; 30 percent pebbles, 25 percent cobbles, and 25 percent stones; moderately acid (pH 5.6).

Type location: White Pine County, Nevada; in Great Basin National Park about 1 mile northwest of Upper Lehman Campground; USGS Windy Peak 7.5 minute topographic quadrangle; 39 degrees, 01 minute, 30 seconds north latitude and 114 degrees, 16 minutes, 03 seconds west longitude; UTM Zone 11 736548, 4323098n, NAD 83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; snow covered from November through April; upper part is saturated for about 15 to 20 consecutive days during snowmelt in April and/or May; Xeric soil moisture regime.

Mean annual soil temperature: 40 to 45 degrees F.

Mean summer soil temperature: 44 to 47 degrees F.

Ochric epipedon thickness: 12 to 28 inches, includes the Oi, A, E1, and E2 horizons.

Depth to top of albic horizon: 2 to 5 inches measured from the mineral soil surface at the top of the A horizon.

Depth to base of cambic horizon: More than 50 inches measured from the mineral soil surface at the top of the A horizon.

Particle-size control section:

Clay content—Averages 15 to 25 percent.

Rock fragments—Averages 60 to 85 percent, mainly cobbles. Lithology of fragments is quartzite and argillite.

A horizon:

Value—5 or 6 dry, 3 or 4 moist.

Chroma—2 or 3, dry or moist.

Reaction—Slightly acid or neutral.

Other features—When the upper 18 cm of the soil is mixed, Munsell soil colors are too light to meet criteria for mollic or umbric epipedons.

E horizons:

Value—6 or 7 dry, 4 or 5 moist.

Chroma—2 or 3, dry or moist.

Texture—Loam or sandy loam.

Rock fragments—60 to 85 percent, mainly cobbles.

Reaction—Slightly acid or neutral.

Other features—These horizons constitute both an albic horizon and part of the cambic horizon.

E and Bt horizons:

Value—6 or 7 dry, 4 or 5 moist.

Chroma—2 through 4, dry or moist.

Texture—Sandy loam or loam.

Clay content—15 to 25 percent.

Rock fragments—60 to 85 percent, mainly cobbles.

Reaction—Moderately acid through neutral.

Other features—Lamellae do not total more than 6 inches in aggregate thickness and do not qualify as an argillic horizon.

Piar series

Depth class: Deep

Drainage class: Well drained

Permeability: Moderate

Runoff: High

Landform: Mountains

Parent material: Kind - Residuum and colluvium; Source - Limestone and calcareous shale

Slope range: 30 to 75 percent

Elevation: 8,560 to 11,250 feet

Mean annual precipitation: 24 to 37 inches

Mean annual air temperature: 35 to 39 degrees F.

Frost-free period: 30 to 50 days

Taxonomic class: Loamy-skeletal, carbonatic Xeric Calcicrypts

Typical pedon: Piar very gravelly loam, in an area of soil map unit 5250, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 50 percent gravel and 10 percent cobbles.

Oi—0 to 1 inch; slightly decomposed plant material composed of conifer needles; abrupt smooth boundary.

A—1 to 3 inches; light brown (7.5YR 6/4) very gravelly loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; 35 percent gravel; strongly effervescent; slightly alkaline (pH 7.8); abrupt smooth boundary.

Bw—3 to 13 inches; light brown (7.5YR 6/4) extremely gravelly loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine and medium roots; many very fine interstitial and few fine tubular pores; 80 percent gravel; strongly effervescent; common secondary calcium carbonate concretions on bottoms of rock fragments; moderately alkaline (pH 8.0); clear smooth boundary.

Bk1—13 to 18 inches; light gray (10YR 7/2) extremely gravelly loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine, and few medium roots; common very fine tubular and interstitial pores; 65 percent gravel; violently effervescent; many secondary calcium carbonate concretions on bottoms of rock fragments; moderately alkaline (pH 8.0); clear smooth boundary.

Bk2—18 to 23 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium, and few coarse roots; common very fine tubular and interstitial pores; 55 percent gravel; violently effervescent; many secondary calcium carbonate concretions on bottom of rock fragments; moderately alkaline (pH 7.9); clear smooth boundary.

Bk3—23 to 35 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine tubular and interstitial pores; 55 percent gravel; violently effervescent; many secondary calcium carbonate concretions around rock fragments and pendants on bottoms of rock fragments; moderately alkaline (pH 7.9); clear wavy boundary.

Bk4—35 to 46 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/6) moist; massive, soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 90 percent gravel; common silt coats on tops of rock

fragments; violently effervescent; many secondary calcium carbonate concretions around rock fragments and pendants on bottom of rock fragments; moderately alkaline (pH 8.0); clear wavy boundary.

Bk5—46 to 53 inches; pale brown (10YR 6/3) extremely gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular and interstitial pores; 60 percent gravel and 5 percent cobbles; common silt coats on tops of rock fragments; violently effervescent; many secondary calcium carbonate concretions around rock fragments and pendants on bottom of rock fragments; moderately alkaline (pH 8.0); abrupt irregular boundary.

R—53 inches; hard, gray limestone.

Type location: White Pine County, Nevada; in Great Basin National Park about 0.3 mile north-northwest of the Saint Lawrence Mine and about 200 feet west of the jeep trail; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 53 minutes, 57 seconds north latitude and 114 degrees, 18 minutes, 41 seconds west longitude; UTM Zone 11N 733160e, 4309018n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; snow covered from November through April; upper part is saturated for about 15 to 20 consecutive days during snowmelt in April and/or May; Xeric soil moisture regime.

Mean annual soil temperature: 38 to 41 degrees F.

Mean summer soil temperature: 45 to 47 degrees F.

Depth to base of cambic horizon: 11 to 15 inches.

Depth to calcic horizon: 11 to 16 inches.

Depth to bedrock: 40 to 60 inches to a lithic contact.

Particle-size control section:

Clay content—Averages 12 to 18 percent.

Rock fragment—Averages 50 to 75 percent gravel and 0 to 10 percent cobbles. Lithology of fragments is mainly limestone.

A horizon:

Hue—7.5YR through 2.5Y.

Value—5 or 6 dry.

Chroma—2 through 4, dry or moist.

Clay content—14 to 20 percent.

Reaction—Neutral or slightly alkaline

Calcium carbonate content—15 to 30 percent in the less than 20 mm fraction, 5 to 15 percent calcium carbonate equivalent in the less than 2 mm fraction.

Bw horizon:

Hue—7.5YR through 2.5Y.

Value—5 through 7 dry.

Chroma—2 through 4, dry or moist.

Clay content—14 to 20 percent.

Consistence—Soft or slightly hard dry, nonsticky or slightly sticky and nonplastic or slightly plastic.

Reaction—Neutral through moderately alkaline.

Calcium carbonate content—30 to 40 percent in the less than 20 mm fraction, 15 to 25 percent calcium carbonate equivalent in the less than 2 mm fraction.

Bk horizons:

Hue—10YR through 5Y.

Value—5 through 7 dry, 4 or 5 moist.

Chroma—2 through 5, dry or moist.

Texture—Loam, fine sandy loam, or sandy loam.

Clay content—12 to 18 percent.

Consistence—Soft or slightly hard dry, nonsticky or slightly sticky and nonplastic or slightly plastic.

Calcium carbonate content—40 to 55 percent in the less than 20 mm fraction, 25 to 35 percent calcium carbonate equivalent in the less than 2 mm fraction.

Pirapeak series

Depth class: Very deep

Drainage class: Somewhat excessively drained

Permeability: Moderately rapid

Runoff: Medium

Landform: Mountains

Parent material: Kind — Colluvium; Source — Granite

Slope range: 30 to 75 percent slopes

Elevation: 9,550 to 11,520 feet

Mean annual precipitation: 24 to 37 inches

Mean annual air temperature: 35 to 39 degrees F.

Frost-free period: 30 to 50 days

Taxonomic class: Sandy-skeletal, mixed Xeric Haplocrypts

Typical pedon: Pirapeak extremely bouldery coarse sandy loam, in an area of soil map unit 5381, forestland. (Colors are for dry soil unless otherwise noted.) The mineral soil surface is covered with approximately 20 percent gravel, 20 percent cobbles, 20 percent stones, and 20 percent boulders.

Oi—0 to 1 inch; slightly decomposed plant material composed of conifer needle duff; abrupt wavy boundary.

A1—1 to 2 inches; grayish brown (10YR 5/2) extremely bouldery coarse sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine roots; common very fine tubular and interstitial pores; 45 percent gravel, 10 percent cobbles, 15 percent stones, and 15 percent boulders; slightly acid (pH 6.2); abrupt smooth boundary.

A2—2 to 6 inches; light brownish gray (10YR 6/2) extremely cobbly coarse sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine tubular and interstitial pores; 25 percent gravel, 25 percent cobbles, and 10 percent stones; slightly acid (pH 6.2); abrupt wavy boundary.

E1—6 to 17 inches; light gray (10YR 7/2) very cobbly coarse sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine through medium, and few coarse roots; common very fine tubular and interstitial pores; 25 percent gravel, 25 percent cobbles, and 5 percent stones; slightly acid (pH 6.4); clear wavy boundary.

E2—17 to 28 inches; light gray (10YR 7/2) extremely cobbly loamy coarse sand, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine, common medium, and few coarse roots; many very fine and fine interstitial pores; 30 percent gravel, 35 percent cobbles, and 5 percent stones; neutral (pH 6.6); clear wavy boundary.

C1—28 to 41 inches; light brownish gray (10YR 6/2) extremely stony loamy coarse sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine, few fine and medium roots; many very fine and fine interstitial pores; 20 percent gravel, 25 percent cobbles, and 35 percent stones; neutral (pH 6.8); clear irregular boundary.

C2—41 to 61 inches; pale brown (10YR 6/3) extremely cobbly loamy coarse sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine

and fine interstitial pores; 30 percent gravel, 35 percent cobbles, and 10 percent stones; slightly acid (pH 6.4).

Type location: White Pine County, Nevada; in Great Basin National Park about 0.67 of a mile east of Johnson Lake; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 56 minutes, 37 seconds north latitude and 114 degrees, 17 minutes, 16 seconds west longitude; UTM Zone 11 735061e, 4314018n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in the moisture control section; dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; snow covered from November through April; upper part is saturated for about 15 to 20 consecutive days during snowmelt in April and/or May; Xeric soil moisture regime.

Mean annual soil temperature: 38 to 41 degrees F.

Mean summer soil temperature: 44 to 47 degrees F.

Ochric epipedon thickness: 12 to 30 inches; includes the Oi, A1, A2, E1, and E2 horizons.

Depth to top of albic horizon: 1 to 7 inches measured from the mineral soil surface at the top of the A1 horizon.

Depth to base of cambic horizon: 10 to 18 inches measured from the mineral soil surface at the top of the A1 horizon.

Reaction: Slightly acid or neutral.

Particle-size control section:

Clay content—Averages 3 to 10 percent.

Rock fragments—Averages 65 to 85 percent, dominantly cobbles and stones, with the less than 3 inch fraction dominated by fine pebbles. Lithology of fragments is granitic rocks.

A1 and A2 horizons:

Value—5 or 6 dry, 3 or 4 moist. Value of 5 dry and 3 moist occurs only in A1 horizons.

Chroma—2 or 3, dry or moist.

Clay content—12 to 18 percent.

E1 horizon:

Value—6 or 7 dry.

Chroma—2 or 3, dry or moist.

Clay content—12 to 18 percent.

E2 and C horizons:

Value—6 or 7 dry.

Chroma—2 or 3, dry or moist.

Clay content—3 to 10 percent.

Rock fragments—65 to 85 percent, mainly cobbles and stones.

Other features—The E2 horizon constitutes part of the albic horizon.

Radol series

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderate

Runoff: High to very high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Limestone and dolomite with minor amounts of shale and sandstone

Slope range: 30 to 75 percent

Elevation: 6,230 to 9,090 feet

Mean annual precipitation: 12 to 14 inches

Mean annual air temperature: 45 to 50 degrees F.

Frost-free period: 90 to 110 days

Taxonomic class: Loamy-skeletal, carbonatic, mesic Lithic Calcixerolls

Typical pedon: Radol very gravelly loam, in the soil survey of Lincoln County, Nevada, North Part, rangeland. (A reference pedon in Great Basin National Park is in map unit 2103 at latitude 38.9188 degrees N and longitude 114.1694 degrees W. Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 30 percent pebbles, 15 percent cobbles and 2 percent stones. Lithology of the fragments is limestone.

A—0 to 2 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate thick platy structure; slightly hard, friable, moderately sticky and moderately plastic; many very fine, common fine and medium, and few coarse roots; common very fine tubular pores; 40 percent pebbles, 5 percent cobbles and 1 percent stones; common (10 percent) secondary calcium carbonate concretions as disoriented coats and pendants on rock fragments; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bk1—2 to 7 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; strong medium subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; many very fine and fine, common medium, and few coarse roots; common very fine tubular pores; 30 percent pebbles, 10 percent cobbles and 1 percent stones; many (30 percent) secondary calcium carbonate concretions around rock fragments and pendants on the bottom of rock fragments; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bk2—7 to 15 inches; brown (10YR 5/3) extremely cobbly loam, dark brown (10YR 3/3) moist; massive; soft, friable, slightly sticky and slightly plastic; common very fine, fine, and medium, and few coarse roots; common very fine tubular pores; 30 percent pebbles, 50 percent cobbles, and 1 percent stones; many (30 percent) secondary calcium carbonate concretions around rock fragments and pendants on the bottom of rock fragments; violently effervescent; moderately alkaline (pH 8.3); very abrupt smooth boundary.

R—15 inches; hard limestone with many (30 percent) hard secondary calcium carbonate concretions around rock fragments and pendants on bottom of rock fragments.

Type location: Lincoln County, Nevada; 100 feet north of jeep trail on Grassy Pass; USGS Dutch John Mtn. 7.5 minute topographic quadrangle; 38 degrees, 23 minutes, 48 seconds north latitude and 114 degrees, 41 minutes, 59 seconds west longitude; UTM Zone 11, 700878e, 4252333n, NAD 83.

Range in Characteristics:

Soil moisture: Usually dry, moist in winter and spring, dry summer and fall except for 10 to 20 days cumulative between July to October due to convection storms. Aridic soil moisture regime bordering on xeric.

Soil temperature: 47 to 52 degrees F.

Depth to bedrock: 14 to 20 inches.

Mollic epipedon thickness: 10 to 20 inches.

Depth to calcic horizon: 2 to 10 inches.

Reaction: Moderately alkaline or strongly alkaline.

Particle-size control section:

Clay content—18 to 27 percent.

Rock fragments—35 to 85 percent.

A horizon:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—3 or 4, dry or moist.

Calcium carbonate equivalent—5 to 20 percent in the material less than 2 mm.

Effervescence—Slightly effervescent to violently effervescent.

Bk horizons:

Value—4 or 5 dry, 3 or 4 moist.

Chroma—3 or 4, dry or moist.

Clay content—18 to 27 percent.

Rock fragments—35 to 85 percent.

Calcium carbonate equivalent—20 to 40 percent in the material less than 2 mm, and 40 to 60 percent in the less than 20 mm fraction.

Effervescence—Strongly effervescent to violently effervescent.

Ripcon series

Depth class: Very deep

Drainage class: Moderately well drained

Permeability: Moderate

Runoff: Low or medium

Landform: Drainageways

Parent material: Kind — Alluvium; Source — Limestone, dolomite, quartzite and granite

Slope range: 2 to 8 percent

Elevation: 6,200 to 7,250 feet

Mean annual precipitation: 12 to 18 inches

Mean annual air temperature: 43 to 45 degrees F.

Frost-free period: 70 to 100 days

Taxonomic class: Loamy-skeletal, mixed, superactive, frigid Cumulic Haploxerolls

Typical pedon: Ripcon gravelly loam, in an area of soil map unit 5425, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 5 percent gravel.

A1—0 to 5 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure parting to strong medium granular; soft, very friable, nonsticky and nonplastic; many very fine and few fine and medium roots; common very fine and fine, and few medium and coarse tubular and interstitial pores; 25 percent gravel; strongly effervescent; slightly alkaline (pH 7.7); clear smooth boundary.

A2—5 to 15 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; strong coarse subangular blocky structure parting to moderate medium subangular blocky; soft, very friable, slightly sticky and nonplastic; common very fine and fine, and few medium roots; common very fine and fine, and few medium and coarse tubular and interstitial pores; 30 percent gravel and 10 percent cobbles; strongly effervescent; strongly alkaline (pH 8.7); clear smooth boundary.

ABk—15 to 33 inches; brown (10YR 5/3) extremely gravelly sandy loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine, and few medium and coarse roots; common very fine, and few fine, medium, and coarse tubular and interstitial pores; common (5 percent) secondary calcium carbonate concretions on bottom of rock fragments; 70 percent gravel and 5 percent cobbles; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary.

Bk1—33 to 50 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine, fine, medium, and coarse roots; common very fine, fine, and medium, and few coarse

tubular and interstitial pores; common (10 percent) secondary calcium carbonate concretions on bottom of rock fragments; 70 percent gravel and 10 percent cobbles; strongly alkaline (pH 8.8).
Bk2—50 to 62 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine, fine, and medium roots; few very fine and fine, and common medium and coarse interstitial pores; common (5 percent) secondary calcium carbonate concretion on bottom of rock fragments; 60 percent gravel and 20 percent cobbles; strongly alkaline (pH 8.9).

Type location: White Pine County, Nevada; in the south Snake Range, in Great Basin National Park, along Snake Creek, about 4 miles east of Shoshone Camp Ground, and 0.25 mile east of Bonita Mine at a small camp site; USGS Kious Spring 7.5 minute topographic quadrangle; 38 degrees, 54 minutes, 57.2 seconds north latitude and 114 degrees, 08 minutes, 54.6 seconds west longitude; UTM zone 11, 0747230e, 4311309n, NAD 83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; This soil receives additional run-on moisture. These soils have a very transitory seasonal water table within 100 cm of the surface during brief periods in March through May in most years; Xeric soil moisture regime.

Mean annual soil temperature: 44 to 47 degrees F.

Mollic epipedon thickness: 20 to 34 inches, with an irregular organic carbon distribution.

Depth to cambic horizon: 20 to 34 inches.

Cambic horizon thickness: 12 to 20 inches.

Particle-size control section:

Clay content—Averages 12 to 18 percent.

Rock fragments—60 to 80 percent. Lithology of the fragments is mainly limestone.

A1 horizon:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Organic matter content—2 to 4 percent.

Reaction—Slightly alkaline to strongly alkaline.

A2 horizon:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Organic matter content—1 to 3 percent.

Reaction—Slightly alkaline to strongly alkaline.

Texture—Loam or sandy loam.

Rock fragments—35 to 70 percent; texture modifier very gravelly or extremely gravelly.

Clay content—12 to 18 percent.

ABk and Bk horizons:

Value—5 or 6 dry, 3 or 4 moist.

Chroma—3 or 4, dry or moist.

Texture—Loam or sandy loam.

Clay content—12 to 18 percent.

Rock fragments—60 to 80 percent; texture modifier is extremely gravelly.

Structure—Weak to moderate, very fine through coarse subangular blocky.

Consistence—Soft or slightly hard, dry.

Reaction—Moderately alkaline or strongly alkaline.

Calcium carbonate equivalent—0 to 5 percent.

Other features—Some pedons contain thin subhorizons with less than 60 percent rock fragments but when averaged it is 60 to 80 percent.

Organic matter—1 to 3 percent.

Rippo series

(Fig. 79)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately rapid

Runoff: Low

Landform: Drainageways

Parent material: Kind — Alluvium; Source — Limestone, dolomite, quartzite and granite

Slope range: 4 to 15 percent

Elevation: 7,380 to 9,020 feet

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 39 to 43 degrees F.

Frost-free period: 40 to 70 days

Taxonomic class: Loamy-skeletal, mixed, superactive, nonacid, frigid Mollic Xerofluvents

Typical pedon: Rippo very cobbly loam, in map unit 5428 in the soil survey of Snake Range Area, Nevada, forestland, about 520 feet east of the Great Basin National Park boundary. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 5 percent gravel, 5 percent cobbles, and 10 percent stones.

Oi—0 to 3 inches; very dark brown (10YR 2/2) slightly decomposed pine needles and twigs, black (10YR 2/1) moist; neutral (pH 6.9); clear smooth boundary.

Oe—3 to 6 inches; very dark brown (10YR 2/2) moderately decomposed pine needles and twigs, black (10YR 2/1) moist; neutral (pH 6.8); clear smooth boundary.

A1—6 to 9 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark brown (10YR 2/2) moist; moderate coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, and few fine and medium roots; common very fine and fine, and few medium and coarse tubular and interstitial pores; 15 percent gravel, 20 percent cobbles, and 10 percent stones; large (5 to 10 cm) 10 percent volume of horizon, masses of fungal hyphae; slightly alkaline (pH 7.5); clear smooth boundary.

A2—9 to 12 inches; dark grayish brown (10YR 4/2) extremely gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine, common medium, and few coarse roots; common very fine and fine, and few medium and coarse tubular and interstitial pores; 50 percent gravel, 25 percent cobbles, and 5 percent stones; large (10 to 15 cm) 20 percent volume of horizon, masses of fungal hyphae; slightly alkaline (pH 7.5); clear smooth boundary.

BC—12 to 21 inches; pale brown (10YR 6/3) extremely cobbly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and nonplastic; few very fine, coarse and very coarse, common fine, and many medium roots; common very fine and fine, and many medium interstitial pores; 40 percent gravel, 35 percent cobbles, and 5 percent stones; neutral (pH 6.8); clear smooth boundary.

C—21 to 60 inches; light yellowish brown (10YR 6/4) extremely stony sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and medium roots; few fine, medium, and coarse interstitial pores; 30 percent gravel, 30 percent cobbles and 25 percent stones; neutral (pH 7.1); gradual smooth boundary.

Type location: White Pine County, Nevada; in the south Snake Range, 100 yards east of Great Basin National Park, along Mill Creek; USGS Windy Peak 7.5 minute topographic quadrangle; 39 degrees, 2

minutes, 24.5 seconds north latitude and 114 degrees, 15 minutes, 3.4 seconds west longitude; UTM zone 11, 0737929e, 4324828n, NAD 83.



Figure 79—The Rippo series is formed in alluvial materials deposited along mountain drainageways.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; This soil receives additional run-on moisture, both surface and subsurface; Xeric soil moisture regime.

Mean annual soil temperature: 42 to 45 degrees F.

Ochric epipedon thickness: 10 to 12 inches. The epipedon is too thin to meet criteria for either folic or mollic epipedon

Particle-size control section:

Clay content—Averages 10 to 18 percent.

Rock fragments—60 to 85 percent, mainly cobbles and stones. Lithology of the fragments is mainly limestone and quartzite.

A horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Organic matter content—2 to 4 percent.

Reaction—Slightly acid to slightly alkaline.

BC and C horizons:

Value—5 or 6 dry, 3 or 4 moist.

Chroma—3 or 4, dry or moist.

Texture—Loam or sandy loam.

Clay content—10 to 18 percent.

Rock fragments—60 to 85 percent; Texture modifiers are extremely stony or extremely cobbly.

Structure—Weak to moderate, very fine to coarse subangular blocky.

Consistence—Soft or slightly hard, dry.

Reaction—Neutral to slightly alkaline.

Other features—Some pedons contain thin subhorizons with less than 60 percent rock fragments but when averaged it is 60 to 80 percent.

Snacreek series

(Figs. 80, 81)

Depth class: Very deep

Drainage class: Moderately well drained

Permeability: Moderately rapid

Runoff: Medium

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Granite

Slope range: 8 to 50 percent

Elevation: 7,120 to 10,500 feet

Mean annual precipitation: 24 to 37 inches

Mean annual air temperature: 35 to 39 degrees F.

Frost-free period: 30 to 50 days

Taxonomic class: Loamy-skeletal, mixed, superactive Pachic Haplocryolls

Typical pedon: Snacreek very gravelly coarse sandy loam, in an area of soil map unit 5350, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 35 percent gravel and about 1 inch of fresh and slightly decomposed aspen leaf litter.

Oi—0 to 1 inch; slightly decomposed plant material composed of conifer needle duff; abrupt wavy boundary.

A1—1 to 2 inches; dark grayish brown (10YR 4/2) very gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine and fine interstitial pores; 35 percent pebbles; moderately acid (pH 5.8); abrupt smooth boundary.

A2—2 to 8 inches; grayish brown (10YR 5/2) very gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine, and common medium and coarse roots; many very fine and fine interstitial pores; 55 percent pebbles; moderately acid (pH 5.8); clear smooth boundary.

A3—8 to 18 inches; grayish brown (10YR 5/2) very gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine, and common medium and coarse roots; many very fine and fine interstitial pores; 55 percent pebbles; moderately acid (pH 5.7); clear wavy boundary.

C1—18 to 29 inches; light yellowish brown (10YR 6/4) extremely gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine, fine and few medium and coarse roots; many very fine and fine interstitial pores; 55 percent pebbles and 15 percent cobbles; strongly acid (pH 5.4); gradual wavy boundary.

C2—29 to 60 inches; light yellowish brown (2.5Y 6/4) extremely gravelly coarse sandy loam, olive brown (2.5Y 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine interstitial pores; 55 percent pebbles and 15 percent cobbles; strongly acid (pH 5.4).



Figure 80

Snacreek soils (Fig. 80) are very deep soils with a high volume of granitic rocks and a seasonal water table within a depth of 122 to 150 cm of the soil surface. An aspen forestland ecological site (Fig. 81) with lesser amounts of Englemann's spruce and limber pine is typical.



Figure 81

Type location: White Pine County, Nevada; in Great Basin National Park about 0.5 mile east of the South Fork of Baker Creek; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 57 minutes, 12 seconds north latitude and 114 degrees, 15 minutes, 24 seconds west longitude; UTM Zone 11 737726e, 4315172n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in the moisture control section in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; snow covered from November through April; upper part is saturated for about 15 to 20 consecutive days during snowmelt in April and/or May; Xeric soil moisture regime.

Mean annual soil temperature: 38 to 41 degrees F.

Mean summer soil temperature: 44 to 47 degrees F.

Mollic epipedon thickness: 16 to 20 inches.

Base saturation: 60 to 80 percent in the mollic epipedon and 50 to 90 percent in the C horizons.

Particle-size control section:

Clay content—6 to 18 percent.

Rock fragments—65 to 85 percent, mainly fine (2 to 5 mm diameter) gravel. Lithology of fragments is granitic rocks.

A horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

Clay content—6 to 14 percent.

Reaction—Moderately acid or slightly acid.

Organic matter content—1 to 4 percent.

C horizons:

Hue—10YR or 2.5Y.

Chroma—3 or 4, dry or moist.

Clay content—12 to 18 percent.

Rock fragments—65 to 85 percent, dominantly fine (2 to 5 mm diameter) gravel.

Reaction—Strongly acid or moderately acid.

Strawbcrek series

(Fig. 82)

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately rapid

Runoff: Medium

Landform: Mountains

Parent material: Kind — Colluvium; Source — Granite

Slope range: 30 to 75 percent

Elevation: 7,840 to 10,700 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Sandy-skeletal, mixed Lamellic Haplocrypts



Figure 82—Strawbcrek series is one of several forest soils that have clay accumulation as thin lamellae within a zone of leaching and movement of clay.

Typical pedon: Strawbcrek very bouldery coarse sandy loam, in an area of soil map unit 5380, forestland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 35 percent pebbles, 5 percent cobbles, 5 percent stones, and 3 percent boulders.

Oi—0 to 2 inches; slightly decomposed plant material composed of conifer needles; abrupt smooth boundary.

A—2 to 3 inches; grayish brown (10YR 5/2) very bouldery coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine tubular and interstitial pores; 25 percent pebbles, 5 percent cobbles, 5 percent stones, and 5 percent boulders; slightly acid (pH 6.5); abrupt smooth boundary.

E1—3 to 11 inches; light gray (10YR 7/2) extremely gravelly coarse sandy loam, grayish brown (10YR 5/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine through coarse roots; common very fine tubular and interstitial pores; common medium distinct dark yellowish brown (10YR 4/4) moist masses of iron accumulation; 50 percent pebbles, 10 percent cobbles, and 5 percent stones; slightly acid (pH 6.4); clear wavy boundary.

E2—11 to 26 inches; light gray (10YR 7/2) extremely gravelly coarse sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine through coarse roots; common very fine tubular and interstitial pores; 50 percent pebbles, 20 percent cobbles, and 5 percent stones; moderately acid (pH 5.9); clear wavy boundary.

E and Bt—26 to 62 inches; 90 percent light gray (10YR 7/2) extremely cobbly loamy coarse sand, brown (10YR 5/3) moist (E part), with 10 percent yellowish brown (10YR 5/4) moist lamellae of coarse sandy

loam (Bt part); massive; soft, very friable, nonsticky and nonplastic; few very fine through coarse roots; common very fine tubular and interstitial pores; common distinct clay films lining pores and bridging sand grains in lamellae; 40 percent pebbles, 30 percent cobbles, and 5 percent stones; moderately acid (pH 5.6).

Type location: White Pine County, Nevada; in Great Basin National Park about 1 mile southeast of the Baker Creek trailhead and 1,500 feet southeast of Timber Creek; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 57 minutes, 42 seconds north latitude and 114 degrees, 15 minutes, 06 seconds west longitude; UTM Zone 11N, 738131e, 4316110n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in the moisture control section in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; snow covered from November through April; upper part is saturated for about 15 to 20 consecutive days during snowmelt in April and/or May; Xeric soil moisture regime.

Mean annual soil temperature: 40 to 45 degrees F.

Mean summer soil temperature: 45 to 47 degrees F.

Ochric epipedon thickness: 16 to 26 inches, includes the Oi, A, E1, and E2 horizons.

Depth to top of albic horizon: 1 to 2 inches measured from the mineral soil surface at the top of the A horizon.

Depth to base of cambic horizon: More than 60 inches measured from the mineral soil surface at the top of the A horizon.

Particle-size control section:

Clay content—2 to 8 percent.

Sand content—60 to 80 percent, with 30 to 40 percent total coarse sand and very coarse sand fractions.

Rock fragments—60 to 80 percent, with 2 to 5 mm diameter pebbles dominating the gravel fraction.

Lithology of fragments is granitic rocks.

A horizon:

Value—4 or 5 dry, 2 or 3 moist.

E horizons:

Value—5 through 7 dry.

Chroma—2 or 3, dry or moist.

Rock fragments—60 to 80 percent, with 2 to 5 mm pebbles dominating the gravel fraction.

Reaction—Slightly acid to strongly acid.

Base saturation—60 to 80 percent.

E and Bt horizon:

Value—5 through 7 dry.

Chroma—3 or 4 moist.

Rock fragments—60 to 80 percent, with 2 to 5 mm pebbles dominating the gravel fraction.

Reaction—Slightly acid to strongly acid.

Base saturation—60 to 80 percent.

Lamellae—1 mm to 10 mm thick lamellae of coarse sandy loam to sandy clay loam are present with cumulative thickness of less than 6 inches.

Timmercrek series

(Fig. 83)

Depth class: Very deep

Drainage class: Well drained
Permeability: Moderately rapid
Runoff: Medium to high
Landform: Ground moraines
Parent material: Kind — Till; Source — Quartzite, shale and argillite
Slope range: 15 to 50 percent slopes
Elevation: 9,480 to 11,250 feet
Mean annual precipitation: 24 to 37 inches
Mean annual air temperature: 35 to 39 degrees F.
Frost-free period: 30 to 50 days

Taxonomic class: Loamy-skeletal, mixed, superactive Xeric Haplocryolls



Figure 83—The thin "O" horizon, or organic soil layer, can be seen at the surface of the Timmercrek series.

Typical pedon: Timmercrek very gravelly highly organic loam, in an area of soil map unit 5410, forestland. (Colors are for dry soil unless other noted.) The soil surface is covered with approximately 25 percent pebbles, 10 percent cobbles, and 3 percent stones.

Oi—0 to 1 inch; partially decomposed leaves and conifer needles.

A1—1 to 4 inches: grayish brown (10YR 5/2) very gravelly highly organic loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; common very fine interstitial pores; 40 percent pebbles and 10 percent stones; slightly acid (pH 6.3) clear wavy boundary.

A2—4 to 13 inches; brown (10YR 5/3) extremely gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine,

and medium, and few coarse roots; common very fine tubular and interstitial pores; 60 percent pebbles and 10 percent cobbles; slightly acid (pH 6.2); clear wavy boundary.

E1—13 to 22 inches; light gray (10YR 7/2) extremely gravelly sandy loam, grayish brown (10YR 5/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine through medium and few coarse roots; many very fine interstitial pores; 65 percent pebbles, 5 percent cobbles, and 5 percent stones; slightly acid (pH 6.4); clear wavy boundary.

E2—22 to 35 inches; light gray (10YR 7/2) extremely gravelly loamy coarse sand, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, and few medium and coarse roots; many very fine and fine interstitial pores; 70 percent pebbles and 10 percent cobbles; slightly acid (pH 6.5); clear wavy boundary.

E and Bt—35 to 44 inches; light gray (10YR 7/2) extremely gravelly sandy loam, grayish brown (10YR 5/2) moist (E part); 10 percent 2 to 5 mm thick light brown (7.5YR 6/4) extremely gravelly sandy loam, strong brown (7.5YR 4/6) moist, lamellae (Bt part); massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular and interstitial pores; common faint clay films bridging sand grains within lamellae; 60 percent pebbles and 5 percent cobbles; slightly acid (pH 6.4); clear wavy boundary.

C—44 to 60 inches; light gray (10YR 7/1) extremely gravelly sandy loam, gray (10YR 5/1) moist; massive, soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular and interstitial pores; 65 percent pebbles and 5 percent cobbles; slightly acid (pH 6.4).

Type location: White Pine County, Nevada; about 1,000 feet east of Wheeler Peak Campground in Great Basin National Park; USGS Windy Peak 7.5 minute topographic quadrangle; approximately 39 degrees, 00 minutes, 40 seconds north latitude and 114 degrees, 17 minutes, 59 seconds west longitude; UTM zone 11, 733804e, 4321473n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in the moisture control section in winter, spring, and early summer, dry in all parts 45 to 60 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; snow covered from November through April; upper part is saturated for about 15 to 20 consecutive days during snowmelt in April and/or May; Xeric soil moisture regime.

Soil temperature: 38 to 41 degrees F.

Mean summer soil temperature: 44 to 47 degrees F.

Base saturation: 50 to 70 percent.

Mollic epipedon thickness: 10 to 16 inches.

Particle-size control section:

Clay content—Average 12 to 18 percent.

Rock fragments—65 to 85 percent, dominantly pebbles.

A horizons:

Value—4 or 5 dry, 2 or 3 moist. Values 4 dry and 2 moist occur only in A1.

Chroma—2 or 3, dry or moist.

E horizons:

Chroma—2 or 3, dry or moist.

Texture—Coarse sandy loam, loamy coarse sand or sandy loam

Clay content—5 to 18 percent.

Rock fragments—65 to 85 percent, dominantly pebbles.

Reaction—Moderately acid or slightly acid.

E and Bt horizons:

Chroma—1 or 2, dry or moist. Lamella have chroma of 4 through 6.

Texture—Dominantly sandy loam, with strata of loamy coarse sand or coarse sandy loam often present.

Clay content—Averages 12 to 18 percent.

Rock fragments—65 to 85 percent, dominantly pebbles.

Reaction—Moderately acid or slightly acid.

Other features—2 to 5 mm thick sandy loam or sandy clay loam lamellae are present, with cumulative thickness of 1 to 5 inches.

Topeki series

(Fig. 84)

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium through very high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Quartzite

Slope range: 8 to 50 percent

Elevation: 6,820 to 10,400 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Loamy-skeletal, mixed, superactive Lithic Haplocryolls



Figure 84—Topeki series is a shallow soil formed over quartzite rock.

Typical pedon: Topeki extremely gravelly loam, in an area of soil map unit 5210, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with approximately 20 percent pebbles, 20 percent cobbles, 20 percent stones, and 3 percent boulders.

A1—0 to 5 inches; dark grayish brown (10YR 4/2) extremely gravelly loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine tubular and interstitial pores; 55 percent pebbles, 10 percent cobbles, and 15 percent stones; moderately acid (pH 5.8); clear wavy boundary.

A2—5 to 12 inches; brown (10YR 5/3) extremely stony loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common very fine tubular and interstitial pores; 10 percent pebbles; 20 percent cobbles and 45 percent stones; slightly acid (pH 6.2); clear wavy boundary.

C—12 to 15 inches; pale brown (10YR 6/3) extremely stony loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular and interstitial pores; 10 percent pebbles, 20 percent cobbles and 45 percent stones; slightly acid (pH 6.2); abrupt irregular boundary.

R—15 inches, hard fractured quartzite bedrock.

Type location: White Pine County, Nevada; about 2 miles north of Bald Mountain in Great Basin National Park, between Strawberry Creek and Windy Canyon; USGS Windy Peak 7.5 minute topographic quadrangle; 39 degrees, 02 minutes, and 52 seconds north latitude and 114 degrees, 19 minutes, and 35 seconds west longitude; UTM Zone 11, 731375e, 4325475n, NAD83

Range in Characteristics:

Soil moisture: Usually moist in the moisture control section in winter, spring, and early summer, dry in all parts 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Xeric soil moisture regime.

Soil temperature: 40 to 45 degrees F.

Mean summer soil temperature: 47 to 50 degrees F.

Thickness of mollic epipedon: 7 to 15 inches.

Depth to bedrock: 10 to 20 inches.

Profile reaction: Slightly acid or moderately acid. Some pedons have thin A1 horizons that are neutral.

Particle-size control section:

Clay content—18 to 25 percent.

Rock fragments—Average 60 to 85 percent, dominantly cobbles and stones.

A horizon:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—2 or 3, dry or moist.

C horizon:

Chroma—2 or 3, dry or moist.

Wardbay series

Depth class: Deep

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium or high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Limestone and dolomite

Slope range: 8 to 75 percent

Elevation: 6,820 to 10,370 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 36 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Loamy-skeletal, carbonatic Pachic Calcicryolls

Typical pedon: Wardbay extremely gravelly loam, in the soil survey of White Pine County, Nevada, East Part, rangeland. (A representative pedon in Great Basin National Park is in map unit at latitude 38.8834 degrees N and longitude 114.2222 degrees W. Colors are for dry soil unless otherwise stated.) The soil surface is covered with 20 percent pebbles.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) extremely gravelly loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; few distinct secondary calcium carbonate coats on bottom of rock fragments; 60 percent pebbles; slightly effervescent; neutral (pH 7.2); clear wavy boundary.

A2—4 to 18 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine, and few medium and coarse roots; common very fine tubular pores; 40 percent pebbles; slightly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.

Bk1—18 to 24 inches; brown (10YR 5/3) extremely cobbly silt loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, fine, and few medium and coarse roots; common very fine tubular pores; many distinct secondary calcium carbonate coats around rock fragments; 40 percent pebbles and 30 percent cobbles; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.

Bk2—24 to 42 inches; brown (10YR 5/3) extremely cobbly silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine tubular pores; many distinct and prominent secondary calcium carbonate coats around rock fragments; 35 percent pebbles and 25 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

2R—42 inches; hard limestone.

Type location: White Pine County, Nevada; approximately 1.5 miles west of Baldy Peak; about 2,300 feet south and 100 feet west of the northeast corner of section 17, T.24 N., R.67 E.; USGS Baldy Peak 7.5 minute topographic quadrangle; 39 degrees, 57 minutes, 30 seconds north latitude and 114 degrees, 25 minutes, 04 seconds west longitude; UTM Zone 11, 720565e, 4426326n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist, moist in winter and spring, dry summer and early fall. Xeric soil moisture regime.

Soil temperature: 42 to 47 degrees F.

Depth to bedrock: 40 to 60 inches.

Mollic epipedon: 35 to 60 inches thick.

Effervescence: Slightly effervescent through violently effervescent.

Calcium carbonate content: 25 to 40 percent, 40 to 60 percent in the less than 20 millimeter fraction.

Particle size control section:

Clay content—18 to 27 percent.

Rock fragments—55 to 85 percent.

A horizons:

Value—4 or 5 dry, 2 or 3 moist.

Chroma—1 through 3, dry or moist.

Reaction—Slightly to moderately alkaline.

Bk horizons:

Value—5 or 6 dry, 3 through 5 moist.

Textures—Loam or silt loam.

Structure—Massive or weak or moderate, fine or medium subangular blocky.

Consistence—Soft or slightly hard dry.

Rock fragments—Texture modifiers are very gravelly, extremely gravelly, very cobbly and extremely cobbly.

Carbonates—Many faint to prominent secondary calcium carbonate pendants, or many faint to prominent secondary calcium carbonate coats around or on bottom of rock fragments.

Wayhigh series

(Figs. 85, 86)

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Moderately rapid

Runoff: Low to high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Limestone and quartzite

Slope range: 2 to 15 percent

Elevation: 11,090 to 11,320 feet

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 34 to 37 degrees F.

Frost-free period: 20 to 40 days



Figure 85—The Wayhigh series receives considerable organic matter from the low-growing alpine vegetation.



Figure 86—Wayhigh soils are on crests and ridges of high mountains. They support an alpine meadow ecological site.

Taxonomic class: Loamy-skeletal, mixed, superactive Xeric Haplocrypts

Typical pedon: Wayhigh very gravelly fine sandy loam, in an area of soil map unit 5255, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 30 percent gravel.

Oi—0 to 2 inches; Slightly decomposed leaves and roots.

Oe—2 to 3 inches; Moderately decomposed plant leaves, stems and roots.

A—3 to 8 inches; brown (10YR 4/3) very gravelly fine sandy loam, dark brown (10YR 3/3) moist; strong medium granular structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; common very fine and fine, and few medium tubular and interstitial pores; 40 percent gravel and 10 percent cobbles; neutral (pH 6.6); clear smooth boundary.

Bw1—8 to 14 inches; yellowish brown (10YR 5/4) very gravelly fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure parting to moderate medium granular; soft, very friable, nonsticky and slightly plastic; many very fine and common fine roots; common very fine and fine, and few medium tubular and interstitial pores; 40 percent gravel and 10 percent cobbles; neutral (pH 7.2); clear smooth boundary.

Bw2—14 to 28 inches; yellowish brown (10YR 5/4) very gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure parting to weak fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine and fine, and few medium tubular and interstitial pores; 35 percent gravel and 15 percent cobbles; very slightly effervescent; neutral (pH 7.0); clear smooth boundary.

Bw3—28 to 35 inches; light yellowish brown (10YR 6/4) extremely gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; strong coarse subangular blocky structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine, and few medium tubular and interstitial pores; 40 percent gravel and 25 percent cobbles; slightly effervescent; neutral (pH 7.1); abrupt smooth boundary.

R—35 inches; indurated, fractured quartzite bedrock.

Type location: White Pine County, Nevada; in Great Basin National Park about 0.75 miles northwest of Mount Washington at the limestone and quartzite contact; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 55 minutes, 29.8 seconds north latitude and 114 degrees, 18 minutes, 12.6 seconds west longitude; UTM zone 11N, 733759e, 4311905n, NAD 83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Additional moisture falls on the site in the form of drifting snow and run-on moisture; Xeric soil moisture regime.

Mean annual soil temperature: 33 to 39 degrees F.

Mean summer soil temperature: 41 to 45 degrees F.

Depth to bedrock: 20 to 40 inches to a lithic contact.

Reaction: Slightly acid or neutral.

Particle-size control section:

Clay content—12 to 18 percent.

Rock fragments—40 to 70 percent, mainly gravel. Lithology of fragments is quartzite with minor amounts of limestone.

A horizon:

Value—4 or 5 dry, and 3 or 4 moist.

Chroma—3 or 4, dry or moist.

Organic matter content—1 to 3 percent.

Bw horizons:

Value—5 or 6 dry, and 3 or 4 moist.

Chroma—4 or 5, dry or moist.

Texture—Loam or fine sandy loam.

Clay content—12 to 18 percent.

Rock fragments—40 to 70 percent.

Calcium carbonate equivalent—0 to 2 percent.

Effervescence—Noneffervescent to slightly effervescent.

Other features—Some pedons may have a thin C horizon.

Wheelerpek series

Depth class: Shallow

Drainage class: Well drained

Permeability: Moderately rapid

Runoff: Very high

Landform: Mountains

Parent material: Kind —Colluvium and residuum; Source — Quartzite

Slope range: 30 to 75 percent

Elevation: 9,350 to 13,060 feet

Mean annual precipitation: 24 to 28 inches

Mean annual air temperature: 32 to 37 degrees F.

Frost-free period: 20 to 40 days

Taxonomic class: Loamy-skeletal, mixed, active, nonacid Lithic Cryorthents

Typical pedon: Wheelerpek extremely gravelly loam, in an area of soil map unit 5330, wildlife habitat. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 50 percent pebbles, 10 percent cobbles, and 15 percent stones.

A1—0 to 4 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and non plastic; common very fine roots; common very fine tubular and interstitial pores; 50 percent pebbles, 10 percent cobbles, and 15 percent stones; slightly acid (pH 6.3); clear wavy boundary.

A2—4 to 9 inches; pale brown (10YR 6/3) extremely cobbly sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and few fine roots; common very fine tubular and interstitial pores; 40 percent pebbles, 25 percent cobbles, and 5 percent stones; slightly acid (pH 6.2); clear wavy boundary.

C—9 to 13 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and nonplastic; common very fine roots; common very fine interstitial and tubular pores; 45 percent pebbles and 25 percent cobbles; slightly acid (pH 6.2); abrupt irregular boundary.

R—13 inches; indurated, fractured quartzite bedrock with soil and roots in fractures.

Type location: White Pine County, Nevada; in Great Basin National Park about 0.5 mile southwest of Wheeler Peak; USGS Wheeler Peak 7.5 minute topographic quadrangle; 38 degrees, 58 minutes, 58 seconds north latitude and 114 degrees, 19 minutes, 24 seconds west longitude; UTM zone 11N, 731852e, 4318268n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Most of the moisture that falls on the site is in the form of snow and is removed from these convex slopes by the wind; Xeric soil moisture regime.

Mean annual soil temperature: 33 to 39 degrees F.

Mean summer soil temperature: 47 to 50 degrees F.

Depth to the base of the ochric epipedon and top of the C horizon: 6 to 10 inches.

Depth to lithic contact: 10 to 20 inches.

Reaction: Moderately acid or slightly acid.

Particle-size control section:

Clay content—12 to 18 percent.

Rock fragments—60 to 80 percent, mainly gravel and cobbles. Lithology of fragments is quartzite.

A horizons:

Chroma—2 or 3, dry or moist.

Consistence—Soft or slightly hard, dry.

C horizon:

Chroma—2 or 3, dry or moist.

Texture—Sandy loam or loam.

Clay content—12 to 18 percent.

Rock fragments—60 to 80 percent.

Consistence—Soft or slightly hard, dry.

Windwash series

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Moderately rapid

Runoff: High to very high

Landform: Mountains

Parent material: Kind — Colluvium and residuum; Source — Limestone and dolomite

Slope range: 8 to 50 percent

Elevation: 9,090 to 11,680 feet

Mean annual precipitation: 20 to 28 inches

Mean annual air temperature: 32 to 37 degrees F.

Frost-free period: 20 to 40 days

Taxonomic class: Loamy-skeletal, carbonatic Xeric Calcicrypts

Typical pedon: Windwash extremely gravelly loamy coarse sand, in an area of soil map unit 5253, wildlife habitat. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 50 percent gravel, 20 percent cobbles, 8 percent stones, and 2 percent boulders. Solifluction lobes that are 2 to 3 meters wide, about 20 to 30 cm high, cover about 50 percent of the surface area.

- A1—0 to 3 inches; pale brown (10YR 6/3) extremely gravelly loamy coarse sand, brown (10YR 4/3) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine, and few medium tubular and interstitial pores; 41 percent calcium carbonate equivalent; 70 percent gravel and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.
- A2—3 to 6 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; many very fine, common fine, and few medium roots; common very fine and fine, and few medium tubular and interstitial pores; 37 percent calcium carbonate equivalent; 40 percent gravel and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.
- Bk—6 to 13 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine, and common medium roots; common very fine and fine, and many medium tubular and interstitial pores; 60 percent calcium carbonate equivalent; finely disseminated calcium carbonate and common (10 percent) secondary calcium carbonate concretions on the bottom of rock fragments forming 1 mm pendants; 60 percent gravel and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- C1—13 to 18 inches; light yellowish brown (10YR 6/4) extremely gravelly loam, dark yellowish brown (10YR 4/4) moist; strong medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine, and few medium interstitial pores; 46 percent calcium carbonate equivalent; 50 percent gravel and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.3); clear smooth boundary.
- C2—18 to 22 inches; light yellowish brown (10YR 6/4) extremely gravelly loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine, and few fine and medium interstitial pores; 55 percent calcium carbonate equivalent; 50 percent gravel and 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.3); abrupt smooth boundary.
- R—22 inches; indurated, fractured limestone bedrock.

Type location: White Pine County, Nevada; in Great Basin National Park about 0.25 mile northwest of Mount Washington and 200 feet west of the parking area at the end of the road; USGS Wheeler Peak

7.5 minute topographic quadrangle; 38 degrees, 54 minutes, 42 seconds north latitude and 114 degrees, 18 minutes, 37 seconds west longitude; UTM zone 11N, 733211e, 4310404n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry in all parts at least 45 consecutive days following the summer solstice (July and August), but intermittently moist in the upper part for 10 to 20 days cumulative due to convection storms between July and September; Most of the moisture that falls on the site is in the form of snow and is removed from these convex slopes by the wind; Xeric soil moisture regime bordering on Aridic.

Mean annual soil temperature: 33 to 39 degrees F.

Mean summer soil temperature: 47 to 50 degrees F.

Depth to calcic horizon: 4 to 8 inches.

Thickness of the calcic horizon: 6 to 12 inches.

Depth to bedrock: 20 to 40 inches to a lithic contact.

Particle-size control section:

Clay content—12 to 18 percent.

Rock fragments—50 to 75 percent, mainly gravel. Lithology of fragments is limestone.

A horizons:

Value—5 or 6 dry, and 3 or 4 moist.

Chroma—3 or 4, dry or moist.

Consistence—Soft or slightly hard, dry.

Calcium carbonate equivalent—35 to 45 percent.

Bk horizon:

Value—6 or 7 dry, and 4 or 5 moist.

Chroma—3 or 4, dry or moist.

Texture—Loam, fine sandy loam, or sandy loam.

Clay content—12 to 18 percent.

Rock fragments—60 to 80 percent; Texture modifier is extremely gravelly.

Reaction—Moderately alkaline or strongly alkaline.

Calcium carbonate equivalent—50 to 70 percent.

Secondary calcium carbonates—Common to many (3 to 25 percent) secondary calcium carbonate concretions around and on the bottom of rock fragments, increasing with depth.

Effervescence—Strongly effervescent or violently effervescent.

Reaction—Moderately alkaline or strongly alkaline.

C horizons:

Value—6 or 7 dry, and 4 or 5 moist.

Chroma—3 or 4, dry or moist.

Texture—Sandy loam, fine sandy loam, or loam.

Clay content—12 to 18 percent.

Rock fragments—60 to 80 percent; Texture modifier is extremely gravelly.

Consistence—Soft or slightly hard, dry.

Calcium carbonate equivalent—40 to 60 percent.

Effervescence—Strongly effervescent or violently effervescent.

Reaction—Moderately alkaline or strongly alkaline.

Zarark series

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Moderate

Runoff: Medium or high

Landform: Mountains

Parent material: Kind —Colluvium and residuum; Source — Limestone

Slope range: 4 to 15 percent

Elevation: 7,450 to 8,430 feet

Mean annual precipitation: 18 to 28 inches

Mean annual air temperature: 37 to 43 degrees F.

Frost-free period: 40 to 60 days

Taxonomic class: Loamy-skeletal, carbonatic Pachic Calcicryolls

Typical pedon: Zarark very gravelly loam, in the soil survey of Humboldt National Forest, Nevada, South Part, rangeland. (A representative pedon in Great Basin National Park is in map unit 5140 at latitude 38.8676 degrees N and longitude 114.1908 degrees W. Colors are for dry soil unless otherwise noted.) The soil surface is covered with approximately 20 percent gravel, and 20 percent cobbles.

A—0 to 4 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine interstitial pores; 40 percent gravel; slightly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.

Bk1—4 to 18 inches; brown (10YR 4/3) very gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine interstitial pores; common medium secondary calcium carbonate concretions on the bottom of rock fragments; 16 percent calcium carbonate equivalent; 45 percent gravel, and 10 percent cobbles; violently effervescent; slightly alkaline (pH 7.5); clear smooth boundary.

Bk2—18 to 28 inches; brown (10YR 5/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, and few medium roots; common very fine and fine interstitial pores; common medium secondary calcium carbonate concretions on the bottom of rock fragments; 45 percent calcium carbonate equivalent; 40 percent gravel and 15 percent cobbles; violently effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary.

R—28 inches; fractured limestone.

Type location: White Pine County, Nevada; in the Schell Creek Range of the Humboldt-Toiyabe National Forest, about 1 mile east of the head of Gilford Creek; USGS South Schell Peak 7.5 minute topographic quadrangle; 39 degrees, 19 minutes, 14.5 seconds north latitude and 114 degrees, 36 minutes, 57.3 seconds west longitude; UTM zone 11, 0705518e, 4355077n, NAD83.

Range in Characteristics:

Soil moisture: Usually moist in winter, spring, and early summer, dry July and early August. Moist intermittently in the upper part from summer convection storms primarily in late August and September. This soil is dry in all parts at least 45 consecutive days following the summer solstice; Typic xeric soil moisture regime.

Mean annual soil temperature: 40 to 45 degrees F.

Mean summer soil temperature: 47 to 50 degrees F.

Mollic epipedon thickness: 16 to 28 inches.

Depth to calcic horizon: 4 to 12 inches.

Depth to bedrock: 20 to 40 inches.

Reaction: Slightly alkaline to moderately alkaline.

Carbonate development stage: Stage 1

Particle-size control section:

Clay content—Averages 10 to 18 percent.

Rock fragments—Averages 40 to 60 percent, mainly gravel. Lithology of the fragments is limestone.

Calcium carbonate—40 to 60 percent in the less than 20 mm fraction.

O horizon:

Slightly decomposed to highly decomposed organic material composed of curleaf mountainmahogany leaves and twigs, and grass residues.

A horizon:

Value—4 or 5 dry.

Organic matter—2 to 4 percent.

Bk1 horizon:

Value—4 or 5 dry.

Chroma—3 or 4 dry and wet

Organic matter—1.5 to 2 percent.

Texture—Loam, fine sandy loam, and sandy loam.

Rock fragments—Average 40 to 60 percent; mainly gravel.

Structure—Weak to moderate, fine through coarse subangular blocky.

Calcium carbonate—Few to common 1 to 2 mm thick concretions on the bottom of rock fragments.

Calcium carbonate equivalent—15 to 25 percent in less than 2 mm fraction.

Bk2 horizon:

Value—5 through 7 dry, and 3 through 7 moist.

Chroma—2 or 3 moist.

Organic matter—0.5 to 1.5 percent.

Texture—Sandy loam and fine sandy loam.

Rock fragments—Average 35 to 60 percent; mainly gravel, some pedons have thin subhorizons with 25 percent gravel.

Calcium carbonate—Few to common 3 to 5 mm thick concretions on the bottom of rock fragments.

Calcium carbonate equivalent—25 to 45 percent in the less than 2 mm fraction.

Formation of the Soils

Soil is a natural three dimensional body on the earth's surface which is capable of supporting plants. It is a dynamic mixture of mineral material, organic matter, water, and air. Each soil has distinctive properties that are the product of environmental forces acting upon earthy material over a period of time.

Many different kinds of soils exist in the soil survey area within relatively short distances. These differences are the result of the interaction of biological forces; climate; relief; parent material; and time. These factors form the ecosystem of soil genesis (Jenny, Hans, 1980).

The soil-forming factors interrelate to develop soil horizons that have specific properties. The age and strength of expression of the horizons is determined by the amount of weathering of the parent material. Weathering is the result of the interaction of moisture, temperature, and biological activity as influenced by time. The kinds and combinations of horizons and other diagnostic properties and their strength of expression provide clues as to the age of the soils in the area (Soil Survey Staff, 1993, Springer, M.E.). Diagnostic horizons present in the soils include mollic or ochric epipedons, albic, cambic, argillic, and carbonate cemented horizons.

Mollic epipedons are thick, dark surface horizons that have high base saturation. They form in areas where organic matter accumulates faster than it is oxidized. The organic matter is added to the soil in the form of decomposed roots and organic residue from the surface. When conditions are favorable, mollic epipedons can form in 100 to 1,000 years. They are the only diagnostic horizons in younger soils, but they occur in combination with other diagnostic horizons in older soils.

Albic horizons in the park occur below the A horizon and are recognized by a color that is largely determined by the color of primary sand and silt particles. These are eluvial horizons. They result when clay and/or free iron oxides are removed or segregated to such an extent that the color of the soil is largely determined by the color of the primary particles. Albic horizons commonly occur as part of a cambic horizon and typically occur above horizons that contain lamella.

Cambic horizons in this survey area are identified by solution and redistribution of carbonates to a lower position in the soil profile, oxidation of the B horizon, and alteration of the original parent material to form platy or blocky structure. Cambic horizons in eastern Nevada generally are thought to be about 5,000 to 10,000 years old. This age has been determined mostly from soil mapping in areas near Lake Lahontan and other Pleistocene lakes (Hawley, J.W. 1965, Mifflin, M.C. 1979, Morrison, R. B. 1964, Morrison, R.B. 1965 and glaciated regions).

Argillic horizons are subsurface horizons that consist of illuvial clay accumulations. Prominent argillic horizons in this area commonly are in soils that formed on surfaces of Wisconsin age and in parent materials other than limestone and other similar rocks (Birkeland, P.W. 1967, Gile, L.H. 1966, Gile, L.H. and Grossman R.B. 1968, Hawley, J.W. 1965, Mock, R.G., Springer, M.E.). Generally, as argillic horizons age they become finer in texture and somewhat thicker and tend to develop an abrupt upper boundary given longer time of development.

The overall landscape of the park is mainly mountains. The present topography and landforms, however, are primarily the result of events that occurred during the Quaternary. Many of the soils started their current development after retreat of the ice and glaciers about 15,000 years ago. The kinds of soils that formed are indicative of the stability and age of the surface of the landforms on which they occur. The degree of development of diagnostic horizons in the soils indicates a range in age from Holocene to mid-Wisconsin. The various kinds of soils in the park are a direct result of this range in age.

Living Organisms

Plants, animals, insects, and microflora are important biological forces that affect soil formation in the survey area. Apart from localized impacts from historic mining and timber harvest and current road building, camp grounds and trails people have had little intensive influence on either the development or destruction of the park soils. On a larger scale, the use of fire by American Indians and later attempts at fire exclusion by Euroamericans has had an immeasurable influence on the soils throughout much of the park. Although mammals such as badgers and ground squirrels, and insects such as cicadas and ants, have had some effect on soil development, plants appear to have had the major biological influence on the soils in this survey area. Vegetation is particularly important as it affects soil erosion. Where vegetation is sparse there is little cover and a higher rate of geological erosion occurs.

Because of climatic differences, plants vary considerably in kinds and amounts as elevation increases. On narrow mountain drainageways and adjacent to areas of springs and seeps where drainage is restricted, the dense meadow and other riparian vegetation has supplied the organic matter necessary for the development of Typic Endoaquolls (Lehmandow series), which has a dark A horizon.

Fan remnants and mountain foothills at the lower elevations support a plant cover of shrubs and grasses. The density of these plants is somewhat great; therefore, moderate amounts of organic matter have accumulated in the A horizon. With increasing elevation and increasing precipitation soluble salts are present at a greater depth in the profile. Examples of soils that formed in these areas are Aridic Calcixerolls (Eenreed series) on fan remnants and Lithic Xeric Haplocalcids (Amtoft series) on mountains.

The higher elevation mountainous areas generally support a denser stand of shrubs and grasses. Because of the more abundant vegetation, the A horizons of the soils in these areas are thicker, higher in organic matter, and darker in color. Examples of soils formed in this vegetation type are Pachic Calcicryolls (Wardbay series) and Aridic Argixerolls (Closkey series). Mountainous areas supporting thick stands of aspen may have a thick dark surface horizon. Xeric Haplocryolls (Berrycreek series) is an example. Other high elevation mountain areas with a cover of conifer trees lack dark surface layers and have ochric epipedons. Xeric Haplocryepts (Pirapeak series) and Xeric Calcicryepts (Bakerpeak series) are examples of these soils.

Climate

The major climatic forces that influence soil formation are precipitation and temperature. Recent soils developed under the present climate, but soils that developed before the Holocene were subject to different climatic conditions. Morrison and Frye (Morrison, R. B. and Frye, J.C. 1965), suggest that accelerated soil formation occurs during unique climatic periods, but the climatic conditions between these periods are not conducive to soil formation. Generally, cool climates having significant temperature fluctuations promote physical disintegration of rocks but retard chemical decomposition of constituent minerals. In contrast, warm climates promote less physical disintegration but enhance chemical decomposition. In either case, little weathering takes place without water. High precipitation contributes to faster weathering overall than low precipitation. As a result, weathering tends to be the least intense under cool, dry climates and the most intense under warm, moist climates.

The present desert climate began at the start of the Pleistocene (Axelrod, D.I. 1950), but both precipitation and temperature have fluctuated greatly. The present climate is characterized by cool, dry summers and cold, wet winters. Precipitation is strongly influenced by the north-south trending mountain ranges, and increases as elevation increases. The average annual precipitation ranges from about 8 inches at the lowest elevations of the park to over 35 inches or more at the highest elevations. Precipitation mainly falls in winter and spring although some is received during summer convection storms.

The average annual air temperature ranges from 48 degrees F. at lower elevations to 35 degrees F. or less in the higher mountain peaks. In winter, freezing and thawing generally occur throughout the survey area, except in those areas that are insulated by snow cover. This frost action causes heaving of plants, development of miniature rings and rock stripes, and erosion as a result of solifluction. Higher elevations areas have had bedrock fractured and displaced as a result of freezing and thawing.

Major climatic variations are a result of the effects of topography and relief. Temperature decreases and precipitation increases as elevation increases. The soils in the survey area generally are divided into climatic zones according to elevation. The variation is reflected in soil temperature regimes, which range

from mesic to cryic, and in the degree of soil development. These trends can be counteracted by variations in local relief, slope aspect, and slope steepness. As the precipitation increases, the removal of soluble salts and the production of native vegetation increase, resulting in the cycling of bases and an increase in organic matter. Fluctuations in temperature and moisture affect the rates of organic matter accumulation and decomposition and the rate of weathering of minerals (Birkeland, P.W. 1974).

At lowest elevations of the park the average annual precipitation is about 8 to 12 inches and the average annual air temperature is about 45 to 50 degrees. Chemical weathering of parent material occurs slowly. Calcium carbonate accumulates somewhat lower in the profile. Typically, the soils are moderately low in organic matter content. They have a thin, relatively dark A horizon or a thicker, light-colored A horizon and a thicker calcic or cambic horizon over accumulations of carbonates. Aridic Calcixerolls (Eenreed series) occur on fan remnants and Lithic Xeric Haplocalcids (Amtoft series) on foothills are examples of soils that formed in this climatic zone.

At elevations of 7,500 to 9,000 feet, the average annual precipitation is about 14 to 24 inches and the average annual air temperature is about 40 to 45 degrees. In these cool, semiarid areas, the increased precipitation and decreased evapotranspiration rate often result in stands of singleleaf pinyon and Utah juniper with localized areas of shrubs and perennial grasses. Because of the lower temperatures, organic matter decomposes at a slower rate and accumulates in the A horizon. Chemical weathering is moderate in this climatic zone. Typically, the soils have a dark mollic epipedon and a strongly developed calcic horizon or argillic horizon in the subsoil. Lithic Calcixerolls (Lodar series) formed on limestone and Aridic Argixerolls (Garnel series) formed on quartzite are examples of soils that formed in this climatic zone.

At elevations of 9,000 to as much as 10,150 feet, the average annual precipitation is about 24 to 38 inches and the average annual air temperature is about 38 to 43 degrees. These areas include windswept crests and steep side slopes of mountains where drifted snow accumulates. This elevation zone receives the greatest snow accumulations, since above this elevation much of the snow is removed by the wind. Most of the calcium carbonate and some exchangeable cations have been removed by leaching to the lower subsoil resulting in a base saturation that generally is lower than in other climatic zones. Organic matter decomposes slowly, and a thick, dark A horizon forms. Areas where drifted snow accumulates, support thick stands of mountain shrubs and a large abundance and diversity of grasses. Windswept areas receive less effective precipitation, which is reflected in lower plant production. Soils on stable, north-facing, concave side slopes in areas where snow accumulates may be older than their degree of development indicates because they remain cold for most of the year, which inhibits development. During glacial periods these soils may have remained frozen or under snow cover throughout the year. Lamellic Haplocryalfs (Ceebee series) on side slopes of mountains and Lithic Haplocryolls (Jonlake series) on windswept crests of mountains are examples of soils that formed in this climatic zone.

Elevations from 10,150 feet to 13,060 have precipitation that exceeds 30 inches and the average annual air temperature is about 34 to 38 degrees F. This area is dominated by windswept ridges and side slopes. Extreme cold temperatures and windswept conditions results in minimal plant growth. As a result there may be little organic matter accumulation and soils have a light colored surface layer. This area was covered by ice during glacial periods. Lithic Cryorthents (Wheelerpek) and Xeric Calcicryepts (Windwash series) are examples.

Relief / Topography

Relief is the shape of the landscape. It is determined by the position of the water table, percent of slope, length of slope, shape of slope (convex or concave), and exposure to wind and sun. Slope aspect can significantly influence soil formation through its effect on the amount of solar insolation received at a site. Compared to northerly facing slopes, southerly facing slopes receive more direct sunlight, making them warmer and generally drier at the surface (but not necessarily at depth) than northerly facing slopes. In most cases, northerly facing slopes experience greater soil development than southerly slopes because of more effective water utilization by plants and lower organisms and by more intense chemical reactions such as weathering. These relationships are well demonstrated by the elevation differences of the various soil temperature regimes; cooler soils extend to lower elevations on north-facing slopes than on south-facing slopes. Any activity on a slope that affects the soil, including erosion and deposition, affects soil formation (Jenny, Hans, 1980).

The landscapes in the park are dominated by mountains rising abruptly from broad alluvium-filled valleys to the east, south and west. Fan remnants slope downward from the mountains on the outer margins of the park (Peterson, Fredrick F. 1981). Glacial moraines formed primarily in Lehman, and Snake Valleys on the east side of the park.

The mountains are characterized by excessive relief. Slope shape can be significant because convex slopes tend to be more erosional in comparison to concave slopes which are commonly depositional. Although water and soil accumulation and soil development are more favorable on concave slopes, natural convex surfaces can be more stable and less disturbed than concave surfaces and thus more mature soils may form on convex surfaces. The soils in these positions are well drained. Runoff is rapid or very rapid, and the hazard of erosion is severe. Mountain slopes that are only partially stabilized are subject to a high rate of geologic erosion, and soil development on these slopes primarily is limited to an accumulation of organic matter that forms a mollic epipedon. Lithic Cryrendolls (Haunchee series) and Lithic Xeric Torriorthents (Eaglepass series) are examples of soils on these slopes. Soil formation has been unable to act on parent material long enough for cambic, calcic, or argillic horizons to form in these soils. Mountain slopes that are more stable are subject to a slower rate of geologic erosion, and a calcic or argillic horizon has formed in the soils on these slopes. Pachic Calcixerolls (Wardbay series) and Aridic Argixerolls (Garnel series) are examples.

Most of the hills and mountains exhibit pronounced aspect-related differences in microclimate. Some soils on north-facing slopes at the lower elevations are similar to soils on south aspects at the higher elevations (Birkeland, P.W. 1974, Jenny, Hans, 1980).

Fan remnants flank the mountains. The soils in these positions are well drained. Runoff is slow or medium and the hazard of erosion is slight or moderate. The fan remnants typically are dissected because the stream channel has been altered as a result of changes in climate or local faulting. This dissection has resulted in the formation of smooth areas of the summits of fan remnants and younger side slopes of fan remnants. Aridic Calcixerolls (Eenreed series) is an example of soils on the summits of fan remnants. Aridic Argixerolls (Millan series) is an example of soils on the side slopes of fan remnants.

The soils on the nearly level mountain drainageways and adjacent to springs and seeps throughout the area are somewhat poorly drained to very poorly drained. Runoff is very slow or slow. Areas of these soils are subject to flooding and some areas are subject to deposition. The soils in these areas support dense stands of meadow or forest riparian vegetation that contributes large amounts of organic matter; thus, these soils have a thin to thick, dark A horizon. The thick vegetation cover is able to accumulate soil material during flood events, thickening the soil surface over the older alluvium which has a high rock fragment content. Typic Endoaquolls (Lehmandow series) is an example of soils in wet meadow positions. Typic Xerorthents (Rippo series) is an example of the soil in forest riparian areas.

Parent Material

Parent material is the weathered rock or unconsolidated material from which soils form. The hardness, grain size, and porosity of the parent material and its mineralogy and chemical composition greatly influence soil formation. The parent material in this survey area is mainly material derived from limestone and quartzite with minor amounts of granite. Southern areas of the park are dominated by limestone and contain soils that have only been stable long enough to form a calcic horizon and in some areas a dark A horizon. Lithic Xeric Haplocalcids (Amtoft series) and Lithic Calcixerolls (Monarch series) are examples of these soils.

The northern areas of the park are made up of primarily quartzite and granite. These parent materials contain minerals that weather to clay. Lithic Argixerolls (Majorsplace series) formed on quartzite and Aridic Argixerolls (Garnel series) formed on granite, are examples of soils that occur on area that have been stable long enough to form an argillic horizon.

Regardless of the kind of parent material, soils with little development occur on unstable slopes that are composed of colluvium that has accumulated as a result of gravitational forces and mass wasting. The colluvium generally is poorly sorted and contains many rock fragments. These areas have only been stable long enough to develop a cambic horizon. Xeric Haplocryolls (Berrycreek series) is an example.

Glacial moraine deposits and glacial till occur in localized areas of the park. These deposits are composed of loamy and sandy material mixed with an assortment of gravel, cobbles, stones and

boulders. There are enough weatherable minerals in these deposits to form horizons with lamella. Lamellic Dystricrypts (Jumble series) and Oxyaquic Haplocrypts (Lemcave series) are examples of soils that occur in these deposits.

Alluvium, throughout most of the park, is limited to narrow, thin deposits along streams and to somewhat wider, thicker accumulations in a dozen or so small mountain basins. Cumulic Haploxerolls (Ripcon series) is an example of soils that formed in narrow drainageways. Alluvium derived from various kinds of rock and deposited as fan remnants at the mountain front or mouth of drainageways is mostly loamy and contains pebbles, cobbles, and stones. It is porous, and may contain minerals that weather to clay, and contains soluble silica and calcium carbonate that results in the cementation of horizons. Petrocalcic Palexerolls (Borvant series) and Aridic Argixerolls (Badena series) are examples of soils that formed on stable fan remnants.

Time

Time is required for the weathering of rocks and minerals and the formation of soil horizons. The interaction of time and other soil-forming factors is not well understood by soil scientists and geologists working in this field. Some suggest that the weathering of parent material and the development of soil profiles essentially have been continuous and at a constant rate throughout the Quaternary (Nikiforoff, C. C. 1942, Nikiforoff, C.C. 1949, Richmond, G.M. 1962, Schoeneberger, P.J., Wysocki D.A., Benham, E.C. and Broderson, W.D.). Recently, however, geologists concerned with differentiating Quaternary deposits have suggested that soil development has not proceeded continuously at the same rate but has taken place intermittently at rapid rates (Morrison, R.B. 1964, Morrison, R.B. 1965, Peterson, Fredrick F.). A soil formed in resistant parent material or in an unfavorable climate might be old in years but immature in development. Another soil in the same region that is younger in chronological age may be more developed if it formed from an easily weathered parent material or under more favorable climatic conditions. The present desert climate began at the start of the Pleistocene (Axelrod, D.I.), but precipitation and temperature have fluctuated greatly. During cooler and wetter glacial periods, or pluvials, the rate of runoff increased, resulting in increased erosion, mass wasting, and deposition. These conditions reduced the rate of evaporation in the basins, and permanent lakes developed on the bolson floors. A change to a cool, drier climate at the beginning of the interglacial periods commonly was marked by maximum eolian activity. Following this was a warm, dry period and then a warm, wet period, which was most conducive to soil development (Anters, E. 1948, Birkeland, P.W. 1967, Morrison, R.B. 1965). These periods of peak soil development occurred worldwide; therefore, the profiles of soils that formed in different regions during these periods can be correlated and are similar in age.

The peak soil-forming periods generally followed periods of increased erosion and deposition. During these periods, the land surfaces stabilized and the climate was favorable for a greatly accelerated rate of chemical weathering. Geologists have developed a technique of mapping soils called soil stratigraphy that uses weathering profiles to differentiate and correlate Quaternary deposits. Researchers have found soils in other parts of Nevada that are similar in age to those that formed on stratigraphic surfaces identified by Morrison (Birkeland, P.W. 1967, Hawley, J.W. and W.E. Wilson III. 1965, Mock, R.G). Comparing soils in this survey area with similar soils in other areas has helped to identify local soils that are similar in age. Although soils developed during each peak soil-forming period, representative profiles have eroded away or have been covered by subsequent depositions in some areas. Because of this, gaps occur in the time-soil profile sequence. In the following paragraphs, some of the time-stratigraphic ages as set forth by Birkeland are discussed (Birkeland, P.W. 1974). These include the Holocene and Wisconsin ages. There are no recognized pre-Wisconsin aged soils in the park.

Holocene

The youngest soils in the park are those that formed in recently aggraded material or in material recently exposed by erosion. These soils have no diagnostic horizons, and they resemble the original parent material. Lithic Xeric Torriorthents (Eaglepass series) and Lithic Cryorthents (Wheelerpek series) formed in material where geologic erosion has been active.

Stable Holocene land surfaces that are 2,000 to 8,000 years old are extensive in the survey area (Gile, L.H. 1966, Gile, L.H., and R.B. Grossman. 1968). The soils that formed on these surfaces have an albic, calcic, or cambic horizon. Some may also have horizons that contain lamella. Lithic Calcixerolls (Lodar

series), Xeric Haplocryepts (Pirapeak series), Xeric Haplocryolls (Berrycreek series) and Lamellic Haplocryepts (Osditch series) are examples.

Fan remnants in some areas were stripped by erosion during the late Wisconsin period exposing a petrocalcic. Following redeposition during the mid to early Holocene, thin layers of loess and loamy alluvium from surrounding areas covered these relict subsurface horizons. Soil development in this material consists of weakly developed cambic or calcic horizons. Shallow Petrocalcic Palexerolls (Borvant series) on fan remnants is an example of a soil surface that developed in this material. Early Holocene and late Wisconsin glacial outwash occurs locally in the park. This glacial outwash occurs on moraines derived from Wisconsin glaciers that occupied Wheeler Peak and Mount Washington. This glacial outwash consists of extremely cobbly and extremely stony quartzite alluvium capped by Holocene loamy alluvium and loess. Lamellic Dystrocryepts (Jumble series) is an example of soils on moraines.

Deposits of Wisconsin age are widely distributed in the survey area. Stable mid-Wisconsin land surfaces that formed in quartzite and granite are extensive in the park at lower elevations. The soils on these surfaces have a loamy-skeletal argillic horizon. Aridic Argixerolls (Garnet series), Typic Argixerolls (Glideski series) and Lithic Argixerolls (Majorsplace) are examples of these soils. Aridic Argixerolls (Millan series) is an example on fan remnants.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone. The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo. The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Back slope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Bajada. A broad alluvial slope extending from the base of a mountain range out into a basin and formed by coalescence of separate alluvial fans.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte. An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds directly beneath the solum, or it is exposed at the surface by erosion.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Canyon. A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque. A semicircular, concave, bowl-like area that has steep faces primarily resulting from glacial ice and snow abrasion.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Congeliturbate. Soil material disturbed by frost action.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coppice dune. A small dune of fine grained soil material stabilized around shrubs or small trees.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cuesta. A hill or ridge that has a gentle slope on one side and a steep slope on the other; specifically, an asymmetric, homoclinal ridge capped by resistant rock layers of slight or moderate dip.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Desert pavement. On a desert surface, a layer of gravel or larger fragments that was emplaced by upward movement of the underlying sediments or that remains after finer particles have been removed by running water or the wind.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized: excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Esker. A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. Area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Head out. To form a flower head.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate

1.25 to 1.75..... moderately high
 1.75 to 2.5..... high
 More than 2.5 very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified glacial drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Ksat. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at 1/3 or 1/10 bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Major Land Resource Area (MLRA). Geographically associated land resource units. The 278 major land resource areas are designated by Arabic numbers and identified by a descriptive geographic name in Agriculture Handbook 296. The dominant physical characteristics of the major land resource areas include: physiography, geology, climate, water, soils, biological resources, and land use.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated upland mass characterized by summit widths that are more than the heights of bounding erosional scarps.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleoterrace. An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable.....	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow.....	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to $\text{Ca}^{++} + \text{Mg}$. The degrees of sodicity and their respective ratios are:

Slight.....	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand.....	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand.....	0.25 to 0.10
Very fine sand.....	0.10 to 0.05
Silt.....	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy (laminated)*, *prismatic (vertical axis of aggregates longer than horizontal)*, *columnar (prisms with rounded tops)*, *blocky (angular or subangular)*, and *granular*. *Structureless* soils are either single grain (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1971-2000 at Great Basin National Park, NV3340)

Month	Temperature (Degrees F.)						Precipitation (Inches)				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			less than	more than		
	F.	F.	F.	F.	F.	Units	In	In	In		In
January---	41.2	20.3	30.7	59	0	15	1.02	0.32	1.62	3	13.2
February--	43.9	22.8	33.3	63	-2	28	1.26	0.50	2.01	3	16.6
March-----	52.1	28.2	40.1	69	9	95	1.19	0.44	1.90	2	8.4
April-----	59.3	33.4	46.3	77	17	224	1.04	0.32	1.70	3	2.6
May-----	67.8	41.1	54.4	84	25	451	1.42	0.79	1.93	3	1.5
June-----	78.0	49.7	63.9	92	32	714	1.37	0.38	2.38	2	0.5
July-----	85.9	57.8	71.8	95	42	985	0.71	0.22	1.12	1	0.0
August----	83.7	56.4	70.0	93	42	929	1.24	0.50	1.99	3	0.0
September-	74.7	47.8	61.3	89	29	630	1.21	0.57	1.79	3	0.0
October---	62.7	38.1	50.4	81	17	343	1.26	0.30	2.27	2	2.1
November--	48.2	25.9	37.1	70	6	82	0.83	0.23	1.43	2	6.8
December--	40.2	19.2	29.7	59	-6	12	0.65	0.14	1.21	2	7.1
Yearly:											
Average-	61.5	36.7	49.1	---	---	---	---	---	---	----	----
Extreme-	96	-19	---	96	-8	---	---	---	---	----	----
Total---	---	---	---	---	---	4,507	13.19	8.51	14.48	29	58.8

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F.

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1971-2000 at Great Basin National Park, NV3340)

Probability	Temperature		
	24 degrees F. or lower	28 degrees F. or lower	32 degrees F. or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 12	May 27	June 10
2 years in 10 later than--	May 5	May 21	June 5
5 years in 10 later than--	April 20	May 9	May 27
First freezing temperature in fall:			
1 year in 10 earlier than--	October 13	September 27	September 14
2 years in 10 earlier than--	October 18	October 4	September 19
5 years in 10 earlier than--	October 28	October 17	September 29

TABLE 3.--GROWING SEASON

(Recorded for the period 1971-2000 at Great Basin National Park, NV3340)

Probability	Daily Minimum Temperature During Growing Season		
	Higher than 24 degrees F.	Higher than 28 degrees F.	Higher than 32 degrees F.
	Days	Days	Days
9 years in 10	158	129	101
8 years in 10	168	137	109
5 years in 10	186	154	123
2 years in 10	204	170	137
1 year in 10	214	179	144

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1650	Noski-Cedarcabin association-----	29	*
1652	Noski-Canyonfork-Cedarcabin association-----	153	0.2
1700	Eenreed-Millan association-----	818	1.1
1900	Borvant extremely gravelly loam, 4 to 30 percent slopes-----	565	0.7
2000	Closkey very gravelly loamy coarse sand, 4 to 30 percent slopes-----	752	1.0
2101	Radol-Logring-Rock outcrop association-----	2,574	3.3
2103	Radol-Hyzen-Rock outcrop association-----	3,242	4.2
2111	Garnel-Rock outcrop association-----	979	1.3
2430	Bellenmine-Basinpeak association-----	522	0.7
2432	Majorsplace-Checkett-Grube association-----	212	0.3
3344	Badena association-----	1,249	1.6
3439	Eaglepass-Rock outcrop-Amtoft association-----	5	*
3900	Osditch extremely stony loam, 30 to 75 percent slopes-----	303	0.4
4140	Lodar-Monarch-Highup association-----	225	0.3
4200	Wardbay-Haunchee-Muiral association-----	281	0.4
5100	Logring-Hyzen-Canyoung association-----	925	1.2
5102	Canyoung-Zarark-Wardbay association-----	350	0.5
5110	Garnel-Garnel, very steep-Rock outcrop association-----	1,254	1.6
5140	Wardbay-Canyoung-Rock outcrop association-----	1,297	1.7
5160	Hyzen-Rock outcrop association-----	1,670	2.2
5210	Badhap-Topeki association-----	2,274	3.0
5220	Basinpeak-Badhap association-----	375	0.5
5240	Wardbay-Haunchee-Bakerpeak association-----	910	1.2
5241	Haunchee-Canyoung-Rock outcrop association-----	396	0.5
5250	Bricone-Piar-Linpeak association-----	4,892	6.3
5251	Bricone-Piar-Rock outcrop association-----	3,492	4.5
5252	Bricone-Rock outcrop association, steep-----	498	0.6
5253	Windwash-Bricone-Rock outcrop association-----	2,171	2.8
5255	Wayhigh very gravelly fine sandy loam, 2 to 15 percent slopes-----	10	*
5261	Jonlake-Badhap-Berrycreek association-----	1,388	1.8
5270	Bakerpeak-Canyoung-Rock outcrop association-----	5,213	6.8
5290	Keyole-Osditch-Topeki association-----	4,413	5.7
5291	Keyole-Rubble land association-----	1,958	2.5
5292	Keyole-Osditch association-----	7,239	9.4
5310	Jumble-Lemcave association-----	564	0.7
5311	Jumble-Lemcave-Gaia association-----	4,139	5.4
5320	Wardbay-Basinpeak association-----	360	0.5
5330	Rubble land-Wheelerpek-Cobblywheel association-----	4,386	5.7
5340	Linpeak-Piar-Bricone association-----	1,547	2.0
5350	Goodski-Kious-Snacreek association-----	4,200	5.4
5380	Ceebee-Strawbcreek association-----	1,783	2.3
5381	Ceebee-Pirapeak association-----	479	0.6
5410	Timmercreek very gravelly highly organic loam, 15 to 50 percent slopes---	671	0.9
5420	Topeki-Badhap-Jonlake association-----	5,507	7.1
5425	Ripcon-Bigwash-Glideski association-----	86	0.1
5428	Rippo-Lehmandow-Brokit association-----	66	*
5430	Brokit very stony highly organic loam, 8 to 15 percent slopes-----	164	0.2
5432	Glideski-Brokit-Lemcave association-----	420	0.5
5434	Lehmandow loam, 2 to 8 percent slopes-----	16	*
5440	Glaciers-----	53	*
	Total-----	77,075	100.0

* Less than 0.1 percent.

TABLE 5.--LAND CAPABILITY CLASSIFICATION

Land capability is a system of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time.

Map symbol and soil name	Land Capability	
	N	I
1650:		
Noski-----	7e	---
Cedarcabin-----	7s	---
Noski-----	7e	---
Rock outcrop-----	---	---
Chainlink-----	7s	---
Monarch-----	7s	---
Canyonfork-----	7s	---
1652:		
Noski-----	7e	---
Canyonfork-----	7s	---
Cedarcabin-----	7s	---
Ravendog-----	6s	---
Rock outcrop-----	---	---
1700:		
Eenreed-----	7s	---
Millan-----	7s	---
Eenreed-----	7s	---
Amtoft-----	7s	---
Borvant-----	8s	---
Jericho-----	7s	---
Badena-----	8s	---
Basinpeak-----	7s	---
1900:		
Borvant-----	8s	---
Badena-----	8s	---
Closkey-----	7s	---
Ripcon-----	7w	---
2000:		
Closkey-----	7s	---
Badhap-----	7s	---
Borvant-----	8s	---
Kious-----	8s	---
Basinpeak-----	7s	---

TABLE 5.--LAND CAPABILITY CLASSIFICATION

Map symbol and soil name	Land Capability	
	N	I
2101:		
Radol-----	7e	---
Logring-----	7s	---
Rock outcrop-----	---	---
Eenreed-----	7s	---
Hopeka-----	7s	---
Canyoung-----	7s	---
Ripcon-----	7w	---
2103:		
Radol-----	7e	---
Hyzen-----	8s	---
Rock outcrop-----	---	---
Grandeposit-----	7e	---
Borvant-----	8s	---
Ripcon-----	7w	---
Osditch-----	8s	---
2111:		
Garnel-----	7s	---
Rock outcrop-----	---	---
Closkey-----	7s	---
2430:		
Bellenmine-----	8s	---
Basinpeak-----	7s	---
Osditch-----	8s	---
Brokit-----	7s	---
Topeki-----	8s	---
Rock outcrop-----	---	---
2432:		
Majorsplace-----	7s	---
Checkett-----	7s	---
Grube-----	8s	---
Rock outcrop-----	---	---
Grandeposit-----	7e	---
Tractuff-----	7s	---
Rubble land-----	---	---
3344:		
Badena-----	8s	---

TABLE 5.--LAND CAPABILITY CLASSIFICATION

Map symbol and soil name	Land Capability	
	N	I
Badena-----	8s	---
Chainlink-----	7s	---
Tractuff-----	7s	---
Huilepass-----	7s	---
Badhap-----	7s	---
Hackwood-----	7s	---
Ripcon-----	7w	---
Lehmandow-----	6w	---
3439:		
Eaglepass-----	8s	---
Rock outcrop-----	---	---
Amtoft-----	7s	---
Monarch-----	7s	---
Logring-----	7s	---
Lodar-----	7s	---
3900:		
Osditch-----	8s	---
Rubble land-----	---	---
Berrycreek-----	7s	---
Jonlake-----	8s	---
Topeki-----	8s	---
Rock outcrop-----	---	---
Keyole-----	8s	---
4140:		
Lodar-----	7s	---
Monarch-----	7s	---
Highup-----	8e	---
Rock outcrop-----	---	---
Radol-----	7e	---
Zarark-----	7s	---
4200:		
Wardbay-----	8e	---
Haunchee-----	7s	---
Muiral-----	7e	---
Badhap-----	7s	---
Brokit-----	7s	---
Pinwheeler-----	7s	---

TABLE 5.--LAND CAPABILITY CLASSIFICATION

Map symbol and soil name	Land Capability	
	N	I
Rock outcrop-----	---	---
Timmercrek family-----	7s	---
5100: Logring-----	7s	---
Hyzen-----	8s	---
Canyoung-----	7s	---
Rock outcrop-----	---	---
Millan-----	7s	---
5102: Canyoung-----	7s	---
Zarark-----	7s	---
Wardbay-----	8e	---
Rock outcrop-----	---	---
Hyzen-----	8s	---
Millan-----	7s	---
Amtoft-----	7s	---
5110: Garnel-----	7s	---
Garnel, very steep-----	7s	---
Rock outcrop-----	---	---
Jonlake-----	8s	---
Kious-----	8s	---
5140: Wardbay-----	8e	---
Canyoung-----	7s	---
Rock outcrop-----	---	---
Wardbay-----	8e	---
Amtoft-----	7s	---
Hardol-----	7e	---
5160: Hyzen-----	8s	---
Rock outcrop-----	---	---
Lodar-----	7s	---
Canyoung-----	7s	---
Hardol-----	7e	---

TABLE 5.--LAND CAPABILITY CLASSIFICATION

Map symbol and soil name	Land Capability	
	N	I
5210:		
Badhap-----	7s	---
Badhap-----	7s	---
Topeki-----	8s	---
Jonlake-----	8s	---
Berrycreek-----	7s	---
Osditch-----	8s	---
Rock outcrop-----	---	---
5220:		
Basinpeak-----	7s	---
Badhap-----	7s	---
Badhap-----	7s	---
Topeki-----	8s	---
Berrycreek-----	7s	---
5240:		
Wardbay-----	8e	---
Haunchee-----	7s	---
Bakerpeak-----	7s	---
Bricone-----	7s	---
Badhap-----	7s	---
Rock outcrop-----	---	---
Brokit-----	7s	---
5241:		
Haunchee-----	7s	---
Canyoung-----	7s	---
Rock outcrop-----	---	---
Wardbay-----	8e	---
Brokit-----	7s	---
Bakerpeak-----	7s	---
5250:		
Bricone-----	7s	---
Piar-----	7s	---
Linpeak-----	7s	---
Bakerpeak-----	7s	---
Rock outcrop-----	---	---
Windwash-----	8s	---
Timmercreek family-----	7s	---

TABLE 5.--LAND CAPABILITY CLASSIFICATION

Map symbol and soil name	Land Capability	
	N	I
5251:		
Bricone-----	7s	---
Piar-----	7s	---
Rock outcrop-----	---	---
Rubble land-----	---	---
Timmercrek family-----	7s	---
Piar-----	7s	---
Linpeak-----	7s	---
Bakerpeak-----	7s	---
5252:		
Bricone-----	7s	---
Rock outcrop-----	---	---
Hyzen-----	8s	---
Monarch-----	7s	---
5253:		
Windwash-----	8s	---
Bricone-----	7s	---
Rock outcrop-----	---	---
Rubble land-----	---	---
Piar-----	7s	---
Timmercrek family-----	7s	---
Windwash-----	8s	---
5255:		
Wayhigh-----	7s	---
Windwash-----	8s	---
Wheelerpek-----	8s	---
5261:		
Jonlake-----	8s	---
Badhap-----	7s	---
Berrycreek-----	7s	---
Topeki-----	8s	---
Badhap-----	7s	---
Rock outcrop-----	---	---
Rippo-----	7s	---
Brokit-----	7s	---

TABLE 5.--LAND CAPABILITY CLASSIFICATION

Map symbol and soil name	Land Capability	
	N	I
5270:		
Bakerpeak-----	7s	---
Canyoung-----	7s	---
Rock outcrop-----	---	---
Hardol-----	7e	---
Timmercrek family-----	7s	---
Bricone-----	7s	---
Wardbay-----	8e	---
Brokit-----	7s	---
Ripcon-----	7w	---
5290:		
Keyole-----	8s	---
Osditch-----	8s	---
Topeki-----	8s	---
Rubble land-----	---	---
Keyole-----	8s	---
Wheelerpek-----	8s	---
Berrycreek-----	7s	---
Brokit-----	7s	---
Timmercrek family-----	7s	---
5291:		
Keyole-----	8s	---
Rubble land-----	---	---
Wheelerpek-----	8s	---
Keyole-----	8s	---
Rock outcrop-----	---	---
5292:		
Keyole-----	8s	---
Osditch-----	8s	---
Berrycreek-----	7s	---
Keyole-----	8s	---
Topeki-----	8s	---
Rock outcrop-----	---	---
5310:		
Jumble-----	8s	---
Lemcave-----	8s	---
Ceebee-----	7s	---

TABLE 5.--LAND CAPABILITY CLASSIFICATION

Map symbol and soil name	Land Capability	
	N	I
Timmercrek-----	7s	---
Brokit-----	7s	---
5311: Jumble-----	8s	---
Lemcave-----	8s	---
Gaia-----	8s	---
Ceebee-----	7s	---
Brokit-----	7s	---
Rubble land-----	---	---
Badhap-----	7s	---
Guiser-----	7s	---
Piar-----	7s	---
Timmercrek family-----	7s	---
Lehmandow-----	6w	---
5320: Wardbay-----	8e	---
Wardbay, convex slopes-----	8e	---
Basinpeak-----	7s	---
Canyoung-----	7s	---
Rock outcrop-----	---	---
Timmercrek family-----	7s	---
5330: Rubble land-----	---	---
Wheelerpek-----	8s	---
Cobblywheel-----	8s	---
Rock outcrop-----	---	---
Keyole-----	8s	---
Bricone-----	7s	---
Wayhigh-----	7s	---
Timmercrek family-----	7s	---
5340: Linpeak-----	7e	---
Piar-----	7s	---
Bricone-----	7s	---
Rubble land-----	---	---
Rock outcrop-----	---	---
Timmercrek family-----	7s	---

TABLE 5.--LAND CAPABILITY CLASSIFICATION

Map symbol and soil name	Land Capability	
	N	I
5350:		
Goodski-----	7s	---
Kious-----	8s	---
Snacreek-----	7s	---
Badhap-----	7s	---
Rock outcrop-----	---	---
Strawbcrek-----	7s	---
Basinpeak-----	7s	---
Lehmandow-----	6w	---
5380:		
Ceebee-----	7s	---
Strawbcrek-----	7s	---
Snacreek-----	7s	---
Rock outcrop-----	---	---
5381:		
Ceebee-----	7s	---
Pirapeak-----	8s	---
Snacreek-----	7s	---
Rock outcrop-----	---	---
5410:		
Timmercrek-----	7s	---
Wheelerpek-----	8s	---
Timmercrek family-----	7s	---
Brokit-----	7s	---
Jumble-----	8s	---
5420:		
Topeki-----	8s	---
Badhap-----	7s	---
Jonlake-----	8s	---
Hardol-----	7e	---
Badhap-----	7s	---
Osditch-----	8s	---
Rock outcrop-----	---	---
Ripcon-----	7w	---
5425:		
Ripcon-----	7w	---
Bigwash-----	6w	---

TABLE 5.--LAND CAPABILITY CLASSIFICATION

Map symbol and soil name	Land Capability	
	N	I
Glideski-----	7s	---
Ravendog-----	6s	---
Devilsgait-----	6w	---
Lehmandow-----	6w	---
Washover-----	6e	---
Canyonfork-----	7s	---
Chainlink-----	7s	---
5428:		
Rippo-----	7s	---
Lehmandow-----	6w	---
Brokit-----	7s	---
Devilsgait-----	6w	---
Steptoe-----	6e	---
Ripcon-----	7w	---
5430:		
Brokit-----	7s	---
Brokit-----	7s	---
Lehmandow-----	6w	---
Glideski-----	7s	---
5432:		
Glideski-----	7s	---
Brokit-----	7s	---
Lemcave-----	8s	---
Lehmandow-----	6w	---
Rock outcrop-----	---	---
Cropper family-----	7s	---
Goodski-----	7s	---
Ripcon-----	7w	---
5434:		
Lehmandow-----	6w	---
Glideski-----	7s	---
Closkey-----	7s	---
Garnel-----	7s	---
5440:		
Glaciers-----	8s	---
Wheelerpek-----	8s	---
Rubble land-----	---	---

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES

[Composition of forest understory based on understory productivity; range site composition is based on percent dry weight. Forest understory is defined as production less than or equal to 13 feet in height. Characteristic plants are pulled from the component existing plants table in the National Soils Information System (NASIS). Absence of an entry indicates the species totaled less than one percent of annual production.]

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
1650: Noski - 35%-----	SHALLOW CALCAREOUS HILL 10-14 P.Z. (R028AY102NV)	Favorable	400	black sagebrush		35
		Normal	250	Indian ricegrass		25
		Unfavorable	125	bluebunch wheatgrass		10
				Stansbury cliffrose		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
				singleleaf pinyon		5
				Utah juniper		2
Cedarcabin - 25%	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides (F028AY074NV)	Favorable	500	black sagebrush	20	
		Normal	300	Indian ricegrass	10	
		Unfavorable	250	bluebunch wheatgrass	10	
				Sandberg bluegrass	5	
				Stansbury cliffrose	5	
				Utah juniper	5	
				bottlebrush squirreltail	5	
				curlleaf mountainmahogany	5	
				muttongrass	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				singleleaf pinyon	5	
				wild crab apple	5	
Noski - 25%-----	SHALLOW CALCAREOUS HILL 10-14 P.Z. (R028AY102NV)	Favorable	400	black sagebrush		35
		Normal	250	Indian ricegrass		25
		Unfavorable	125	bluebunch wheatgrass		10
				Stansbury cliffrose		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
				singleleaf pinyon		5
				Utah juniper		2
1652: Noski - 35%-----	SHALLOW CALCAREOUS HILL 10-14 P.Z. (R028AY102NV)	Favorable	400	black sagebrush		35
		Normal	250	Indian ricegrass		25
		Unfavorable	125	bluebunch wheatgrass		10
				Stansbury cliffrose		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
				singleleaf pinyon		5
				Utah juniper		2
Canyonfork - 30%	CALCAREOUS FAN PIEDMONT 10-14 P.Z. (R028AY087NV)	Favorable	800	bluebunch wheatgrass		30
		Normal	600	black sagebrush		25
		Unfavorable	400	Indian ricegrass		10
				Stansbury cliffrose		5
				needleandthread		5
				other perennial forbs		5
				other perennial forbs		5
				other shrubs		5
				wild crab apple		5
				other trees		2
Cedarcabin - 25%	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides (F028AY074NV)	Favorable	500	black sagebrush	20	
		Normal	300	Indian ricegrass	10	
		Unfavorable	250	bluebunch wheatgrass	10	
				Sandberg bluegrass	5	
				Stansbury cliffrose	5	
				Utah juniper	5	

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
				bottlebrush squirreltail	5	
				curlleaf mountainmahogany	5	
				muttongrass	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				singleleaf pinyon	5	
				wild crab apple	5	
1700:						
Eenreed - 40%---	SHALLOW CALCAREOUS LOAM 10-14 P.Z. (R028AY043NV)	Favorable	800	bluebunch wheatgrass		30
		Normal	600	black sagebrush		25
		Unfavorable	400	Indian ricegrass		10
				other shrubs		10
				Stansbury cliffrose		5
				muttongrass		5
				needleandthread		5
				other perennial forbs		5
				blue grama		2
Millan - 30%----	SHALLOW LOAM 10-14 P.Z. (R028AY064NV)	Favorable	800	bluebunch wheatgrass		30
		Normal	500	mountain big sagebrush		25
		Unfavorable	300	Indian ricegrass		15
				other perennial forbs		10
				muttongrass		5
				other perennial grasses		5
				other shrubs		5
				other trees		2
Eenreed - 15%---	SHALLOW CALCAREOUS SLOPE 10-14 P.Z. (R028AY034NV)	Favorable	600	bluebunch wheatgrass		30
		Normal	400	black sagebrush		25
		Unfavorable	200	Indian ricegrass		10
				Stansbury cliffrose		5
				needleandthread		5
				other perennial forbs		5
				other shrubs		5
				Sandberg bluegrass		3
				other perennial grasses		3
				blue grama		2
				other trees		2
1900:						
Borvant - 90%---	SHALLOW CALCAREOUS LOAM 10-14 P.Z. (R028AY043NV)	Favorable	800	bluebunch wheatgrass		30
		Normal	600	black sagebrush		25
		Unfavorable	400	Indian ricegrass		10
				other shrubs		10
				Stansbury cliffrose		5
				muttongrass		5
				needleandthread		5
				other perennial forbs		5
				blue grama		2
2000:						
Closkey - 85%---	GRAVELLY LOAM 12-14 P.Z. (R028AY066NV)	Favorable	1200	antelope bitterbrush		35
		Normal	900	bluebunch wheatgrass		20
		Unfavorable	700	Thurber needlegrass		10
				mountain big sagebrush		10
				bluegrass		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
				other trees		2

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
2101: Radol - 40%-----	SHALLOW CALCAREOUS HILL 10-14 P.Z. (R028AY102NV)	Favorable	400	black sagebrush		35
		Normal	250	Indian ricegrass		25
		Unfavorable	125	bluebunch wheatgrass		10
				Stansbury cliffrose		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
				singleleaf pinyon		5
				Utah juniper		2
Logring - 25%---	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides (F028AY074NV)	Favorable	500	black sagebrush	20	
		Normal	300	Indian ricegrass	10	
		Unfavorable	250	bluebunch wheatgrass	10	
				Sandberg bluegrass	5	
				Stansbury cliffrose	5	
				Utah juniper	5	
				bottlebrush squirreltail	5	
				curlleaf mountainmahogany	5	
				muttongrass	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				singleleaf pinyon	5	
				wild crab apple	5	
2103: Radol - 40%-----	SHALLOW CALCAREOUS HILL 10-14 P.Z. (R028AY102NV)	Favorable	400	black sagebrush		35
		Normal	250	Indian ricegrass		25
		Unfavorable	125	bluebunch wheatgrass		10
				Stansbury cliffrose		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
				singleleaf pinyon		5
				Utah juniper		2
Hyzen - 30%-----	LIMESTONE HILL (R028AY029NV)	Favorable	900	littleleaf mountain		60
		Normal	700	mahogany		
		Unfavorable	500	other shrubs		10
				Scribner needlegrass		5
				Stansbury cliffrose		5
				black sagebrush		5
				other perennial forbs		5
				spiny greasebush		5
				galleta		3
2111: Garnel - 70%-----	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa (F028AY077NV)	Favorable	500	mountain big sagebrush	20	
		Normal	350	Utah serviceberry	10	
		Unfavorable	250	antelope bitterbrush	10	
				bluebunch wheatgrass	10	
				curlleaf mountainmahogany	10	
				muttongrass	10	
				basin wildrye	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				snowberry	5	
				singleleaf pinyon	4	
				other trees	1	

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
2430: Bellenmine - 70%	Pinus monophylla-Juniperus osteosperma/Artemisia arbuscula/Pseudoroegneria spicata ssp. spicata-Poa fendleriana (F028AY075NV)	Favorable Normal Unfavorable	500 300 150	low sagebrush Utah serviceberry bluebunch wheatgrass muttongrass Utah juniper curlleaf mountainmahogany other perennial forbs other perennial grasses other shrubs singleleaf pinyon white fir	30 10 10 10 5 5 5 5 5 5 5	
Basinpeak - 15%	CLAYPAN 14+ P.Z. (R028AY061NV)	Favorable Normal Unfavorable	800 600 450	bluebunch wheatgrass low sagebrush other perennial forbs other shrubs muttongrass needlegrass other perennial grasses		40 20 10 10 5 5 5
2432: Majorsplace - 40%-----	SHALLOW CALCAREOUS HILL 10-14 P.Z. (R028AY102NV)	Favorable Normal Unfavorable	400 250 125	black sagebrush Indian ricegrass bluebunch wheatgrass Stansbury cliffrose other perennial forbs other perennial grasses other shrubs singleleaf pinyon Utah juniper		35 25 10 5 5 5 5 5 2
Checkett - 30%--	SHALLOW CALCAREOUS LOAM 10-14 P.Z. (R028AY043NV)	Favorable Normal Unfavorable	800 600 400	bluebunch wheatgrass black sagebrush Indian ricegrass other shrubs Stansbury cliffrose muttongrass needleandthread other perennial forbs blue grama		30 25 10 10 5 5 5 5 2
Grube - 15%----	SHALLOW LOAM 10-14 P.Z. (R028AY064NV)	Favorable Normal Unfavorable	800 500 300	bluebunch wheatgrass mountain big sagebrush Indian ricegrass other perennial forbs muttongrass other perennial grasses other shrubs other trees		30 25 15 10 5 5 5 2
3344: Badena - 60%----	SHALLOW LOAM 10-14 P.Z. (R028AY064NV)	Favorable Normal Unfavorable	800 500 300	bluebunch wheatgrass mountain big sagebrush Indian ricegrass other perennial forbs muttongrass other perennial grasses other shrubs other trees		30 25 15 10 5 5 5 2
Badena - 25%----	LOAMY 10-12 P.Z. (R028AY095NV)	Favorable Normal Unfavorable	1000 800 600	needleandthread Wyoming big sagebrush bluebunch wheatgrass Indian ricegrass Thurber needlegrass other perennial forbs other perennial grasses other shrubs other trees		30 25 15 5 5 5 5 5 2

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
3439: Eaglepass - 45%--	LIMESTONE HILL (R028AY029NV)	Favorable	900	littleleaf mountain		60
		Normal	700	mahogany		
		Unfavorable	500	other shrubs		10
				Scribner needlegrass		5
				Stansbury cliffrose		5
				black sagebrush		5
				other perennial forbs		5
				spiny greasebush		5
				galleta		3
Amtoft - 15%----	SHALLOW CALCAREOUS HILL 10-14 P.Z. (R028AY102NV)	Favorable	400	black sagebrush		35
		Normal	250	Indian ricegrass		25
		Unfavorable	125	bluebunch wheatgrass		10
				Stansbury cliffrose		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
				singleleaf pinyon		5
				Utah juniper		2
3900: Osditch - 85%---	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa (F028AY080NV)	Favorable	350	other perennial forbs	15	
		Normal	150	Oregongrape	10	
		Unfavorable	50	other perennial grasses	10	
				other shrubs	10	
				skyline bluegrass	10	
				Rocky Mountain Douglas	5	
				fir		
				common juniper	5	
				mountain snowberry	5	
				muttongrass	5	
				other trees	5	
				quaking aspen	5	
				sedge	5	
				white fir	5	
4140: Lodar - 35%-----	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides (F028AY074NV)	Favorable	500	black sagebrush	20	
		Normal	300	Indian ricegrass	10	
		Unfavorable	250	bluebunch wheatgrass	10	
				Sandberg bluegrass	5	
				Stansbury cliffrose	5	
				Utah juniper	5	
				bottlebrush squirreltail	5	
				curlleaf mountainmahogany	5	
				muttongrass	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				singleleaf pinyon	5	
				wild crab apple	5	
Monarch - 30%---	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa (F028AY077NV)	Favorable	500	mountain big sagebrush	20	
		Normal	350	Utah serviceberry	10	
		Unfavorable	250	antelope bitterbrush	10	
				bluebunch wheatgrass	10	
				curlleaf mountainmahogany	10	
				muttongrass	10	
				basin wildrye	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				snowberry	5	
				singleleaf pinyon	4	
				other trees	1	

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
Highup - 20%----	STONY MAHOGANY SAVANNA (R028AY058NV)	Favorable	1300	curlleaf mountainmahogany		54
		Normal	900	mountain big sagebrush		20
		Unfavorable	600	bluebunch wheatgrass		10
				Letterman needlegrass		5
				other perennial forbs		5
				mountain snowberry		2
				muttongrass		2
				other perennial grasses		2
4200: Wardbay - 50%---	SHALLOW LOAM 14+ P.Z. (R028AY065NV)	Favorable	800	bluebunch wheatgrass		60
		Normal	600	mountain big sagebrush		15
		Unfavorable	400	mountain snowberry		5
				muttongrass		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
Haunchee - 20%--	STONY MAHOGANY SAVANNA (R028AY058NV)	Favorable	1300	curlleaf mountainmahogany		54
		Normal	900	mountain big sagebrush		20
		Unfavorable	600	bluebunch wheatgrass		10
				Letterman needlegrass		5
				other perennial forbs		5
				mountain snowberry		2
				muttongrass		2
				other perennial grasses		2
Muiral - 15%----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa (F028AY080NV)	Favorable	350	other perennial forbs	15	
		Normal	150	Oregongrape	10	
		Unfavorable	50	other perennial grasses	10	
				other shrubs	10	
				skyline bluegrass	10	
				Rocky Mountain Douglas fir	5	
				common juniper	5	
				mountain snowberry	5	
				muttongrass	5	
				other trees	5	
				quaking aspen	5	
				sedge	5	
				white fir	5	
5100: Logring - 45%---	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides (F028AY074NV)	Favorable	500	black sagebrush	20	
		Normal	300	Indian ricegrass	10	
		Unfavorable	250	bluebunch wheatgrass	10	
				Sandberg bluegrass	5	
				Stansbury cliffrose	5	
				Utah juniper	5	
				bottlebrush squirreltail	5	
				curlleaf mountainmahogany	5	
				muttongrass	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				singleleaf pinyon	5	
				wild crab apple	5	
Hyzen - 25%-----	LIMESTONE HILL (R028AY029NV)	Favorable	900	littleleaf mountain		60
		Normal	700	mahogany		
		Unfavorable	500	other shrubs		10
				Scribner needlegrass		5
				Stansbury cliffrose		5
				black sagebrush		5
				other perennial forbs		5
				spiny greasebush		5
				galleta		3

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
Canyoung - 15%--	MAHOGANY SAVANNA (R028AY059NV)	Favorable	2500	curlleaf mountainmahogany		34
		Normal	1800	bluebunch wheatgrass		20
		Unfavorable	1200	mountain big sagebrush		20
				muttongrass		5
				needlegrass		5
				other perennial forbs		5
				other perennial grasses		5
				mountain snowberry		2
				other shrubs		2
				other trees		2
5102: Canyoung - 40%--	MAHOGANY SAVANNA (R028AY059NV)	Favorable	2500	curlleaf mountainmahogany		34
		Normal	1800	bluebunch wheatgrass		20
		Unfavorable	1200	mountain big sagebrush		20
				muttongrass		5
				needlegrass		5
				other perennial forbs		5
				other perennial grasses		5
				mountain snowberry		2
				other shrubs		2
				other trees		2
Zarark - 30%----	MAHOGANY SAVANNA (R028AY059NV)	Favorable	2500	curlleaf mountainmahogany		34
		Normal	1800	bluebunch wheatgrass		20
		Unfavorable	1200	mountain big sagebrush		20
				muttongrass		5
				needlegrass		5
				other perennial forbs		5
				other perennial grasses		5
				mountain snowberry		2
				other shrubs		2
				other trees		2
Wardbay - 20%---	SHALLOW LOAM 14+ P.Z. (R028AY065NV)	Favorable	800	bluebunch wheatgrass		60
		Normal	600	mountain big sagebrush		15
		Unfavorable	400	mountain snowberry		5
				muttongrass		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
5110: Garnel - 45%----	Pinus monophylla/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa fendleriana (F028AY076NV)	Favorable	500	bluebunch wheatgrass	25	
		Normal	350	mountain big sagebrush	25	
		Unfavorable	200	Utah serviceberry	10	
				muttongrass	10	
				other shrubs	10	
				other perennial forbs	5	
				other perennial grasses	5	
				singleleaf pinyon	5	
				other trees	2	
Garnel - 30%----	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa (F028AY077NV)	Favorable	500	mountain big sagebrush	20	
		Normal	350	Utah serviceberry	10	
		Unfavorable	250	antelope bitterbrush	10	
				bluebunch wheatgrass	10	
				curlleaf mountainmahogany	10	
				muttongrass	10	
				basin wildrye	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				snowberry	5	
				singleleaf pinyon	4	
				other trees	1	

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
5140: Wardbay - 45%---	SHALLOW LOAM 14+ P.Z. (R028AY065NV)	Favorable Normal Unfavorable	800 600 400	bluebunch wheatgrass mountain big sagebrush mountain snowberry muttongrass other perennial forbs other perennial grasses other shrubs		60 15 5 5 5 5 5
Canyoung - 25%--	MAHOGANY SAVANNA (R028AY059NV)	Favorable Normal Unfavorable	2500 1800 1200	curlleaf mountainmahogany bluebunch wheatgrass mountain big sagebrush muttongrass needlegrass other perennial forbs other perennial grasses mountain snowberry other shrubs other trees		34 20 20 5 5 5 5 2 2 2
5160: Hyzen - 65%----	LIMESTONE HILL (R028AY029NV)	Favorable Normal Unfavorable	900 700 500	littleleaf mountain mahogany other shrubs Scribner needlegrass Stansbury cliffrose black sagebrush other perennial forbs spiny greasebush galleta		60 10 5 5 5 5 5 3
5210: Badhap - 35%----	SHALLOW LOAM 14+ P.Z. (R028AY065NV)	Favorable Normal Unfavorable	800 600 400	bluebunch wheatgrass mountain big sagebrush mountain snowberry muttongrass other perennial forbs other perennial grasses other shrubs		60 15 5 5 5 5 5
Badhap - 25%----	LOAMY 16+ P.Z. (R028AY057NV)	Favorable Normal Unfavorable	2300 1500 1000	slender wheatgrass mountain big sagebrush mountain brome needlegrass nodding brome other perennial forbs mountain snowberry other perennial grasses other shrubs sedge Nevada bluegrass		20 15 10 10 10 5 5 5 3 2
Topeki - 25%----	STONY MAHOGANY SAVANNA (R028AY058NV)	Favorable Normal Unfavorable	1300 900 600	curlleaf mountainmahogany mountain big sagebrush bluebunch wheatgrass Letterman needlegrass other perennial forbs mountain snowberry muttongrass other perennial grasses		54 20 10 5 5 2 2 2
5220: Basinpeak - 60%--	CLAYPAN 14+ P.Z. (R028AY061NV)	Favorable Normal Unfavorable	800 600 450	bluebunch wheatgrass low sagebrush other perennial forbs other shrubs muttongrass needlegrass other perennial grasses		40 20 10 10 5 5 5

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
Badhap - 25%----	LOAMY SLOPE 16+ P.Z. (R028AY068NV)	Favorable	1700	bluebunch wheatgrass		25
		Normal	1200	mountain big sagebrush		15
		Unfavorable	900	slender wheatgrass		15
				Utah serviceberry		5
				mountain brome		5
				mountain snowberry		5
				needlegrass		5
				nodding brome		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
				Nevada bluegrass		3
				muttongrass		2
5240: Haunchee - 35%--	MAHOGANY SAVANNA (R028AY059NV)	Favorable	2500	curlleaf mountainmahogany		34
		Normal	1800	bluebunch wheatgrass		20
		Unfavorable	1200	mountain big sagebrush		20
				muttongrass		5
				needlegrass		5
				other perennial forbs		5
				other perennial grasses		5
				mountain snowberry		2
				other shrubs		2
				other trees		2
Wardbay - 35%---	SHALLOW LOAM 14+ P.Z. (R028AY065NV)	Favorable	800	bluebunch wheatgrass		60
		Normal	600	mountain big sagebrush		15
		Unfavorable	400	mountain snowberry		5
				muttongrass		5
				other perennial forbs		5
				other perennial grasses		5
Bakerpeak - 15%--	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa (F028AY080NV)	Favorable	350	other perennial forbs	15	
		Normal	150	Oregongrape	10	
		Unfavorable	50	other perennial grasses	10	
				other shrubs	10	
				skyline bluegrass	10	
				Rocky Mountain Douglas fir	5	
				common juniper	5	
				mountain snowberry	5	
				muttongrass	5	
				other trees	5	
				quaking aspen	5	
				sedge	5	
				white fir	5	
5241: Haunchee - 40%--	STONY MAHOGANY SAVANNA (R028AY058NV)	Favorable	1300	curlleaf mountainmahogany		54
		Normal	900	mountain big sagebrush		20
		Unfavorable	600	bluebunch wheatgrass		10
				Letterman needlegrass		5
				other perennial forbs		5
				mountain snowberry		2
				muttongrass		2
				other perennial grasses		2
Canyoung - 30%--	MAHOGANY SAVANNA (R028AY059NV)	Favorable	2500	curlleaf mountainmahogany		34
		Normal	1800	bluebunch wheatgrass		20
		Unfavorable	1200	mountain big sagebrush		20
				muttongrass		5
				needlegrass		5
				other perennial forbs		5
				other perennial grasses		5
				mountain snowberry		2
				other shrubs		2
				other trees		2

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
5250: Bricone - 55%---	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa (F028AY081NV)	Favorable	200	currant	25	
		Normal	100	whitestem goldenbush	20	
		Unfavorable	50	common juniper	10	
				Great Basin bristlecone pine	5	
				Wheeler's bluegrass	5	
				limber pine	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				sedge	5	
				skyline bluegrass	5	
Linpeak - 15%---	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii (F028AY084NV)	Favorable	400	gooseberry currant	20	
		Normal	250	Engelmann's spruce	15	
		Unfavorable	100	other perennial forbs	15	
				American red raspberry	5	
				Ross' sedge	5	
				limber pine	5	
				mountain brome	5	
				mountain snowberry	5	
				needlegrass	5	
				other perennial grasses	5	
				quaking aspen	5	
				skyline bluegrass	5	
				white fir	5	
Piar - 15%-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa (F028AY082NV)	Favorable	300	gooseberry currant	25	
		Normal	200	whitestem goldenbush	15	
		Unfavorable	100	Oregongrape	10	
				common juniper	10	
				Great Basin bristlecone pine	5	
				Ross' sedge	5	
				Wheeler's bluegrass	5	
				limber pine	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other trees	5	
				skyline bluegrass	5	
5251: Bricone - 50%---	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa (F028AY081NV)	Favorable	200	currant	25	
		Normal	100	whitestem goldenbush	20	
		Unfavorable	50	common juniper	10	
				Great Basin bristlecone pine	5	
				Wheeler's bluegrass	5	
				limber pine	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				sedge	5	
				skyline bluegrass	5	
Piar - 20%-----	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii (F028AY083NV)	Favorable	300	needlegrass	20	
		Normal	200	gooseberry currant	10	
		Unfavorable	100	mountain brome	10	
				other perennial forbs	10	
				Engelmann's spruce	5	
				Ross' sedge	5	
				common juniper	5	
				limber pine	5	
				muttongrass	5	
				other perennial grasses	5	
				other trees	5	
				quaking aspen	5	
				skyline bluegrass	5	
				slender wheatgrass	5	

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
5252: Bricone - 60%---	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa (F028AY081NV)	Favorable	200	currant	25	
		Normal	100	whitestem goldenbush	20	
		Unfavorable	50	common juniper	10	
				Great Basin bristlecone pine	5	
				Wheeler's bluegrass	5	
				limber pine	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				sedge	5	
5253: Windwash - 40%---	CALCAREOUS ALPINE RIDGE (R028AY070NV)	Favorable	150	other perennial forbs		55
		Normal	100	Wheeler's bluegrass		10
		Unfavorable	75	timberline bluegrass		10
				Engelmann's spruce		5
				Ross' sedge		5
				alpine fescue		5
				dunhead sedge		5
				other shrubs		2
Bricone - 30%---	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa (F028AY081NV)	Favorable	200	currant	25	
		Normal	100	whitestem goldenbush	20	
		Unfavorable	50	common juniper	10	
				Great Basin bristlecone pine	5	
				Wheeler's bluegrass	5	
				limber pine	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				sedge	5	
5255: Wayhigh - 90%---	ALPINE MEADOW (R028AY129NV)	Favorable	500	other perennial forbs		25
		Normal	400	Ross' sedge		20
		Unfavorable	300	dunhead sedge		20
				Wheeler's bluegrass		10
				cushion phlox		10
				other perennial grasses		5
				other shrubs		5
5261: Jonlake - 45%---	CLAYPAN 14+ P.Z. (R028AY061NV)	Favorable	800	bluebunch wheatgrass		40
		Normal	600	low sagebrush		20
		Unfavorable	450	other perennial forbs		10
				other shrubs		10
				muttongrass		5
				needlegrass		5
				other perennial grasses		5
Badhap - 25%---	SHALLOW LOAM 14+ P.Z. (R028AY065NV)	Favorable	800	bluebunch wheatgrass		60
		Normal	600	mountain big sagebrush		15
		Unfavorable	400	mountain snowberry		5
				muttongrass		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
Berrycreek - 15%	Populus tremuloides-Picea engelmannii/Symphoricarpo s oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus (F028AY078NV)	Favorable	1000	other perennial forbs	15	
		Normal	700	Engelmann's spruce	10	
		Unfavorable	400	mountain brome	10	
				quaking aspen	10	
				slender wheatgrass	10	
				Nevada bluegrass	5	
				Oregongrape	5	
				Utah serviceberry	5	
				mountain snowberry	5	
				other shrubs	5	
				other trees	5	
				skyline bluegrass	5	
				white fir	5	
				willow	5	
5270:						
Bakerpeak - 40%	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa (F028AY080NV)	Favorable	350	other perennial forbs	15	
		Normal	150	Oregongrape	10	
		Unfavorable	50	other perennial grasses	10	
				other shrubs	10	
				skyline bluegrass	10	
				Rocky Mountain Douglas fir	5	
				common juniper	5	
				mountain snowberry	5	
				muttongrass	5	
				other trees	5	
				quaking aspen	5	
				sedge	5	
				white fir	5	
Canyoung - 35%--	MAHOGANY SAVANNA (R028AY059NV)	Favorable	2500	curlleaf mountainmahogany		34
		Normal	1800	bluebunch wheatgrass		20
		Unfavorable	1200	mountain big sagebrush		20
				muttongrass		5
				needlegrass		5
				other perennial forbs		5
				other perennial grasses		5
				mountain snowberry		2
				other shrubs		2
				other trees		2
5290:						
Keyole - 40%----	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii (F028AY083NV)	Favorable	300	needlegrass	20	
		Normal	200	gooseberry currant	10	
		Unfavorable	100	mountain brome	10	
				other perennial forbs	10	
				Engelmann's spruce	5	
				Ross' sedge	5	
				common juniper	5	
				limber pine	5	
				muttongrass	5	
				other perennial grasses	5	
				other trees	5	
				quaking aspen	5	
				skyline bluegrass	5	
				slender wheatgrass	5	

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
Osditch - 25%---	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa (F028AY080NV)	Favorable	350	other perennial forbs	15	
		Normal	150	Oregongrape	10	
		Unfavorable	50	other perennial grasses	10	
				other shrubs	10	
				skyline bluegrass	10	
				Rocky Mountain Douglas fir	5	
				common juniper	5	
				mountain snowberry	5	
				muttongrass	5	
				other trees	5	
				quaking aspen	5	
				sedge	5	
				white fir	5	
Topeki - 20%---	STONY MAHOGANY SAVANNA (R028AY058NV)	Favorable	1300	curlleaf mountainmahogany		54
		Normal	900	mountain big sagebrush		20
		Unfavorable	600	bluebunch wheatgrass		10
				Letterman needlegrass		5
				other perennial forbs		5
				mountain snowberry		2
				muttongrass		2
				other perennial grasses		2
5291: Keyole - 50%---	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii (F028AY083NV)	Favorable	300	needlegrass	20	
		Normal	200	gooseberry currant	10	
		Unfavorable	100	mountain brome	10	
				other perennial forbs	10	
				Engelmann's spruce	5	
				Ross' sedge	5	
				common juniper	5	
				limber pine	5	
				muttongrass	5	
				other perennial grasses	5	
				other trees	5	
				quaking aspen	5	
				skyline bluegrass	5	
				slender wheatgrass	5	
5292: Keyole - 50%---	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii (F028AY083NV)	Favorable	300	needlegrass	20	
		Normal	200	gooseberry currant	10	
		Unfavorable	100	mountain brome	10	
				other perennial forbs	10	
				Engelmann's spruce	5	
				Ross' sedge	5	
				common juniper	5	
				limber pine	5	
				muttongrass	5	
				other perennial grasses	5	
				other trees	5	
				quaking aspen	5	
				skyline bluegrass	5	
				slender wheatgrass	5	
Osditch - 35%---	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa (F028AY080NV)	Favorable	350	other perennial forbs	15	
		Normal	150	Oregongrape	10	
		Unfavorable	50	other perennial grasses	10	
				other shrubs	10	
				skyline bluegrass	10	
				Rocky Mountain Douglas fir	5	
				common juniper	5	
				mountain snowberry	5	
				muttongrass	5	
				other trees	5	
				quaking aspen	5	
				sedge	5	
				white fir	5	

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
5310: Jumble - 55%----	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii (F028AY083NV)	Favorable	300	needlegrass	20	
		Normal	200	gooseberry currant	10	
		Unfavorable	100	mountain brome	10	
				other perennial forbs	10	
				Engelmann's spruce	5	
				Ross' sedge	5	
				common juniper	5	
				limber pine	5	
				muttongrass	5	
				other perennial grasses	5	
				other trees	5	
				quaking aspen	5	
				skyline bluegrass	5	
				slender wheatgrass	5	
Lemcave - 30%---	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa (F028AY080NV)	Favorable	350	other perennial forbs	15	
		Normal	150	Oregongrape	10	
		Unfavorable	50	other perennial grasses	10	
				other shrubs	10	
				skyline bluegrass	10	
				Rocky Mountain Douglas fir	5	
				common juniper	5	
				mountain snowberry	5	
				muttongrass	5	
				other trees	5	
				quaking aspen	5	
				sedge	5	
				white fir	5	
5311: Jumble - 40%----	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii (F028AY083NV)	Favorable	300	needlegrass	20	
		Normal	200	gooseberry currant	10	
		Unfavorable	100	mountain brome	10	
				other perennial forbs	10	
				Engelmann's spruce	5	
				Ross' sedge	5	
				common juniper	5	
				limber pine	5	
				muttongrass	5	
				other perennial grasses	5	
				other trees	5	
				quaking aspen	5	
				skyline bluegrass	5	
				slender wheatgrass	5	
Lemcave - 30%---	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa (F028AY080NV)	Favorable	350	other perennial forbs	15	
		Normal	150	Oregongrape	10	
		Unfavorable	50	other perennial grasses	10	
				other shrubs	10	
				skyline bluegrass	10	
				Rocky Mountain Douglas fir	5	
				common juniper	5	
				mountain snowberry	5	
				muttongrass	5	
				other trees	5	
				quaking aspen	5	
				sedge	5	
				white fir	5	

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
Gaia - 15%-----	MAHOGANY SAVANNA (R028AY059NV)	Favorable	2500	curlleaf mountainmahogany		34
		Normal	1800	bluebunch wheatgrass		20
		Unfavorable	1200	mountain big sagebrush		20
				muttongrass		5
				needlegrass		5
				other perennial forbs		5
				other perennial grasses		5
				mountain snowberry		2
				other shrubs		2
				other trees		2
5320: Wardbay - 40%---	CALCAREOUS LOAM 14+ P.Z. (R028AY067NV)	Favorable	1100	bluebunch wheatgrass		50
		Normal	800	mountain big sagebrush		10
		Unfavorable	600	muttongrass		10
				basin wildrye		5
				mountain snowberry		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
				other trees		2
Wardbay - 30%---	SHALLOW LOAM 14+ P.Z. (R028AY065NV)	Favorable	800	bluebunch wheatgrass		60
		Normal	600	mountain big sagebrush		15
		Unfavorable	400	mountain snowberry		5
				muttongrass		5
				other perennial forbs		5
				other perennial grasses		5
Basinpeak - 20%--	CLAYPAN 14+ P.Z. (R028AY061NV)	Favorable	800	bluebunch wheatgrass		40
		Normal	600	low sagebrush		20
		Unfavorable	450	other perennial forbs		10
				other shrubs		10
				muttongrass		5
				needlegrass		5
5330: Wheelerpek - 30%	ALPINE RIDGE (R028AY069NV)	Favorable	150	other perennial forbs		50
		Normal	100	Wheeler's bluegrass		10
		Unfavorable	75	bluegrass		10
				Engelmann's spruce		5
				Ross' sedge		5
				alpine fescue		5
				dunhead sedge		5
				other trees		3
				bottlebrush squirreltail		2
				other perennial grasses		2
				other shrubs		2
Cobblywheel - 25%-----	ALPINE RIDGE (R028AY069NV)	Favorable	150	other perennial forbs		50
		Normal	100	Wheeler's bluegrass		10
		Unfavorable	75	bluegrass		10
				Engelmann's spruce		5
				Ross' sedge		5
				alpine fescue		5
				dunhead sedge		5
				other trees		3
				bottlebrush squirreltail		2
				other perennial grasses		2
				other shrubs		2

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
5340: Linpeak - 50%---	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii (F028AY084NV)	Favorable	400	gooseberry currant	20	
		Normal	250	Engelmann's spruce	15	
		Unfavorable	100	other perennial forbs	15	
				American red raspberry	5	
				Ross' sedge	5	
				limber pine	5	
				mountain brome	5	
				mountain snowberry	5	
				needlegrass	5	
				other perennial grasses	5	
				quaking aspen	5	
				skyline bluegrass	5	
				white fir	5	
Piar - 20%-----	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii (F028AY083NV)	Favorable	300	needlegrass	20	
		Normal	200	gooseberry currant	10	
		Unfavorable	100	mountain brome	10	
				other perennial forbs	10	
				Engelmann's spruce	5	
				Ross' sedge	5	
				common juniper	5	
				limber pine	5	
				muttongrass	5	
				other perennial grasses	5	
				other trees	5	
				quaking aspen	5	
				skyline bluegrass	5	
				slender wheatgrass	5	
Bricone - 15%---	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa (F028AY081NV)	Favorable	200	currant	25	
		Normal	100	whitestem goldenbush	20	
		Unfavorable	50	common juniper	10	
				Great Basin bristlecone pine	5	
				Wheeler's bluegrass	5	
				limber pine	5	
				other perennial forbs	5	
				other perennial grasses	5	
				other shrubs	5	
				sedge	5	
				skyline bluegrass	5	
5350: Goodski - 35%---	SHALLOW LOAM 14+ P.Z. (R028AY065NV)	Favorable	800	bluebunch wheatgrass		60
		Normal	600	mountain big sagebrush		15
		Unfavorable	400	mountain snowberry		5
				muttongrass		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
Kious - 35%-----	MAHOGANY SAVANNA (R028AY059NV)	Favorable	2500	curlleaf mountainmahogany		34
		Normal	1800	bluebunch wheatgrass		20
		Unfavorable	1200	mountain big sagebrush		20
				muttongrass		5
				needlegrass		5
				other perennial forbs		5
				other perennial grasses		5
				mountain snowberry		2
				other shrubs		2
				other trees		2

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
Snacreek - 15%--	Populus tremuloides-Picea engelmannii/Symphoricarpo s oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus (F028AY078NV)	Favorable	1000	other perennial forbs	15	
		Normal	700	Engelmann's spruce	10	
		Unfavorable	400	mountain brome	10	
				quaking aspen	10	
				slender wheatgrass	10	
				Nevada bluegrass	5	
				Oregongrape	5	
				Utah serviceberry	5	
				mountain snowberry	5	
				other shrubs	5	
				other trees	5	
				skyline bluegrass	5	
				white fir	5	
				willow	5	
5380:						
Ceebee - 50%----	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii (F028AY084NV)	Favorable	400	gooseberry currant	20	
		Normal	250	Engelmann's spruce	15	
		Unfavorable	100	other perennial forbs	15	
				American red raspberry	5	
				Ross' sedge	5	
				limber pine	5	
				mountain brome	5	
				mountain snowberry	5	
				needlegrass	5	
				other perennial grasses	5	
				quaking aspen	5	
				skyline bluegrass	5	
				white fir	5	
Strawbcrek - 40%	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa (F028AY080NV)	Favorable	350	other perennial forbs	15	
		Normal	150	Oregongrape	10	
		Unfavorable	50	other perennial grasses	10	
				other shrubs	10	
				skyline bluegrass	10	
				Rocky Mountain Douglas fir	5	
				common juniper	5	
				mountain snowberry	5	
				muttongrass	5	
				other trees	5	
				quaking aspen	5	
				sedge	5	
				white fir	5	
5381:						
Ceebee - 50%----	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii (F028AY084NV)	Favorable	400	gooseberry currant	20	
		Normal	250	Engelmann's spruce	15	
		Unfavorable	100	other perennial forbs	15	
				American red raspberry	5	
				Ross' sedge	5	
				limber pine	5	
				mountain brome	5	
				mountain snowberry	5	
				needlegrass	5	
				other perennial grasses	5	
				quaking aspen	5	
				skyline bluegrass	5	
				white fir	5	

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
Pirapeak - 40%--	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii (F028AY083NV)	Favorable	300	needlegrass	20	
		Normal	200	gooseberry currant	10	
		Unfavorable	100	mountain brome	10	
				other perennial forbs	10	
				Engelmann's spruce	5	
				Ross' sedge	5	
				common juniper	5	
				limber pine	5	
				muttongrass	5	
				other perennial grasses	5	
				other trees	5	
				quaking aspen	5	
				skyline bluegrass	5	
				slender wheatgrass	5	
5410: Timmercrek - 85%	Populus tremuloides-Picea engelmannii/Symphoricarpo s oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus (F028AY078NV)	Favorable	1000	other perennial forbs	15	
		Normal	700	Engelmann's spruce	10	
		Unfavorable	400	mountain brome	10	
				quaking aspen	10	
				slender wheatgrass	10	
				Nevada bluegrass	5	
				Oregongrape	5	
				Utah serviceberry	5	
				mountain snowberry	5	
				other shrubs	5	
				other trees	5	
				skyline bluegrass	5	
				white fir	5	
				willow	5	
5420: Badhap - 35%----	SHALLOW LOAM 14+ P.Z. (R028AY065NV)	Favorable	800	bluebunch wheatgrass		60
		Normal	600	mountain big sagebrush		15
		Unfavorable	400	mountain snowberry		5
				muttongrass		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
Topeki - 35%----	STONY MAHOGANY SAVANNA (R028AY058NV)	Favorable	1300	curlleaf mountainmahogany		54
		Normal	900	mountain big sagebrush		20
		Unfavorable	600	bluebunch wheatgrass		10
				Letterman needlegrass		5
				other perennial forbs		5
				mountain snowberry		2
				muttongrass		2
Jonlake - 15%---	CLAYPAN 14+ P.Z. (R028AY061NV)	Favorable	800	bluebunch wheatgrass		40
		Normal	600	low sagebrush		20
		Unfavorable	450	other perennial forbs		10
				other shrubs		10
				muttongrass		5
				needlegrass		5
				other perennial grasses		5
5425: Ripcon - 40%----	Populus angustifolia/Salix-Betula occidentalis/Carex (F028AY079NV)	Favorable	2500	sedge	25	
		Normal	2000	bluegrass	10	
		Unfavorable	1500	other perennial forbs	10	
				basin wildrye	8	
				narrowleaf cottonwood	5	
				other perennial grasses	5	
				other shrubs	5	
				rush	5	
				skunkbush sumac	5	
				slender wheatgrass	5	
				water birch	5	
				willow	5	
				other trees	2	

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
Bigwash - 30%---	LOAMY BOTTOM 14+ P.Z. (R028AY055NV)	Favorable	4000	basin wildrye		60
		Normal	2500	mountain big sagebrush		10
		Unfavorable	1500	Nevada bluegrass		5
				other perennial forbs		5
				other shrubs		5
				slender wheatgrass		5
				other perennial grasses		3
				willow		3
Glideski - 15%--	LOAMY 12-14 P.Z. (R028AY092NV)	Favorable	1400	bluebunch wheatgrass		35
		Normal	1000	mountain big sagebrush		15
		Unfavorable	800	needlegrass		15
				antelope bitterbrush		5
				basin wildrye		5
				muttongrass		5
				other perennial forbs		5
				other perennial grasses		5
				other shrubs		5
				other trees		2
5428: Rippo - 45%----	Pinus ponderosa var. scopulorum/Salix/Carex nebrascensis (F028AY128NV)	Favorable	1800	other perennial forbs	10	
		Normal	1500	other perennial grasses	10	
		Unfavorable	1000	Booth's willow	9	
				Kentucky bluegrass	9	
				Nebraska sedge	9	
				Woods' rose	9	
				sandbar willow	9	
				Baltic rush	5	
				beardless wildrye	5	
				other shrubs	5	
				other trees	5	
				ponderosa pine	5	
				water birch	5	
Lehmandow - 25%--	WET MEADOW (R028AY072NV)	Favorable	3000	tufted hairgrass		35
		Normal	1700	other perennial forbs		20
		Unfavorable	1000	Nevada bluegrass		10
				other perennial grasses		10
				Shrubby cinquefoil		5
				alpine timothy		5
				other shrubs		5
Brokit - 15%----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex (F028AY056NV)	Favorable	1600	Nevada bluegrass	10	
		Normal	1300	other perennial forbs	10	
		Unfavorable	1000	rush	10	
				sedge	10	
				skyline bluegrass	10	
				slender wheatgrass	10	
				mountain snowberry	5	
				other perennial grasses	5	
				other shrubs	5	
				other trees	5	
				quaking aspen	5	
				white fir	5	
				willow	5	

TABLE 6.--ECOLOGICAL SITES AND CHARACTERISTIC PLANT COMMUNITIES--CONTINUED

(Composition of forest understory based on canopy cover; range sites are based on percent weight.)

Map unit symbol soil name - % of map unit	Ecological site name and number	Total production		Characteristic plants	Composition	
		Kind of year	Dry weight		Forest	Range
			Lb/ac		Pct	Pct
5430: Brokit - 85%----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex (F028AY056NV)	Favorable Normal Unfavorable	1600 1300 1000	Nevada bluegrass other perennial forbs rush sedge skyline bluegrass slender wheatgrass mountain snowberry other perennial grasses other shrubs other trees quaking aspen white fir willow	10 10 10 10 10 10 5 5 5 5 5 5 5	
5432: Glideski - 35%--	LOAMY 12-14 P.Z. (R028AY092NV)	Favorable Normal Unfavorable	1400 1000 800	bluebunch wheatgrass mountain big sagebrush needlegrass antelope bitterbrush basin wildrye muttongrass other perennial forbs other perennial grasses other shrubs other trees		35 15 15 5 5 5 5 5 5 2
Brokit - 30%----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex (F028AY056NV)	Favorable Normal Unfavorable	1600 1300 1000	Nevada bluegrass other perennial forbs rush sedge skyline bluegrass slender wheatgrass mountain snowberry other perennial grasses other shrubs other trees quaking aspen white fir willow	10 10 10 10 10 10 5 5 5 5 5 5 5	
Lemcave - 20%---	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa (F028AY080NV)	Favorable Normal Unfavorable	350 150 50	other perennial forbs Oregongrape other perennial grasses other shrubs skyline bluegrass Rocky Mountain Douglas fir common juniper mountain snowberry muttongrass other trees quaking aspen sedge white fir	15 10 10 10 10 5 5 5 5 5 5 5	
5434: Lehmandow - 90%--	WET MEADOW (R028AY072NV)	Favorable Normal Unfavorable	3000 1700 1000	tufted hairgrass other perennial forbs Nevada bluegrass other perennial grasses Shrubby cinquefoil alpine timothy other shrubs sedge clover		35 20 10 10 5 5 5 5 2

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

(Only soils and miscellaneous land types with correlated ecological sites are shown)

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
1650:			
35%-Noski-----	SHALLOW CALCAREOUS HILL 10-14 P.Z.	Rangeland	R028AY102NV
25%-Cedarcabin-----	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata-Achnatherum hymenoides	Forestland	F028AY074NV
25%-Noski-----	SHALLOW CALCAREOUS HILL 10-14 P.Z.	Rangeland	R028AY102NV
4%-Chainlink-----	SHALLOW CALCAREOUS SLOPE 10-14 P.Z.	Rangeland	R028AY034NV
3%-Canyonfork-----	CALCAREOUS FAN PIEDMONT 10-14 P.Z.	Rangeland	R028AY087NV
3%-Monarch-----	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa	Forestland	F028AY077NV
1652:			
35%-Noski-----	SHALLOW CALCAREOUS HILL 10-14 P.Z.	Rangeland	R028AY102NV
30%-Canyonfork-----	CALCAREOUS FAN PIEDMONT 10-14 P.Z.	Rangeland	R028AY087NV
25%-Cedarcabin-----	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata-Achnatherum hymenoides	Forestland	F028AY074NV
7%-Ravendog-----	LOAMY FAN 10-14 P.Z.	Rangeland	R028AY091NV
1700:			
40%-Eenreed-----	SHALLOW CALCAREOUS LOAM 10-14 P.Z.	Rangeland	R028AY043NV
30%-Millan-----	SHALLOW LOAM 10-14 P.Z.	Rangeland	R028AY064NV
15%-Eenreed-----	SHALLOW CALCAREOUS SLOPE 10-14 P.Z.	Rangeland	R028AY034NV
4%-Amtoft-----	SHALLOW CALCAREOUS SLOPE 10-14 P.Z.	Rangeland	R028AY034NV
3%-Badena-----	LOAMY 10-12 P.Z.	Rangeland	R028AY095NV
3%-Borvant-----	SHALLOW CALCAREOUS LOAM 10-14 P.Z.	Rangeland	R028AY043NV
3%-Jericho-----	SHALLOW CALCAREOUS SLOPE 8-10 P.Z.	Rangeland	R028AY004NV
2%-Basinpeak-----	CLAYPAN 14+ P.Z.	Rangeland	R028AY061NV
1900:			
90%-Borvant-----	SHALLOW CALCAREOUS LOAM 10-14 P.Z.	Rangeland	R028AY043NV
5%-Badena-----	LOAMY 10-12 P.Z.	Rangeland	R028AY095NV
3%-Closkey-----	GRAVELLY LOAM 12-14 P.Z.	Rangeland	R028AY066NV
2%-Ripcon-----	Populus angustifolia/Salix- Betula occidentalis/Carex	Forestland	F028AY079NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
2000:			
85%-Closkey-----	GRAVELLY LOAM 12-14 P.Z.	Rangeland	R028AY066NV
6%-Badhap-----	LOAMY SLOPE 16+ P.Z.	Rangeland	R028AY068NV
4%-Borvant-----	SHALLOW CALCAREOUS SLOPE 10-14 P.Z.	Rangeland	R028AY034NV
3%-Kiouss-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
2%-Basinpeak-----	CLAYPAN 14+ P.Z.	Rangeland	R028AY061NV
2101:			
40%-Radol-----	SHALLOW CALCAREOUS HILL 10-14 P.Z.	Rangeland	R028AY102NV
25%-Logring-----	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata-Achnatherum hymenoides	Forestland	F028AY074NV
6%-Eenreed-----	SHALLOW CALCAREOUS SLOPE 10-14 P.Z.	Rangeland	R028AY034NV
5%-Hopeka-----	LIMESTONE HILL	Rangeland	R028AY029NV
3%-Canyoung-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
1%-Ripcon-----	Populus angustifolia/Salix- Betula occidentalis/Carex	Forestland	F028AY079NV
2103:			
40%-Radol-----	SHALLOW CALCAREOUS HILL 10-14 P.Z.	Rangeland	R028AY102NV
30%-Hyzen-----	LIMESTONE HILL	Rangeland	R028AY029NV
4%-Grandeposit-----	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata-Achnatherum hymenoides	Forestland	F028AY074NV
3%-Borvant-----	SHALLOW CALCAREOUS LOAM 10-14 P.Z.	Rangeland	R028AY043NV
2%-Ripcon-----	Populus angustifolia/Salix- Betula occidentalis/Carex	Forestland	F028AY079NV
1%-Osditch-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
2111:			
70%-Garnel-----	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa	Forestland	F028AY077NV
5%-Closkey-----	GRAVELLY LOAM 12-14 P.Z.	Rangeland	R028AY066NV
2430:			
70%-Bellenmine-----	Pinus monophylla-Juniperus osteosperma/Artemisia arbuscula/Pseudoroegneria spicata ssp. spicata-Poa fendleriana	Forestland	F028AY075NV
15%-Basinpeak-----	CLAYPAN 14+ P.Z.	Rangeland	R028AY061NV
5%-Osditch-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
4%-Brokit-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV
4%-Topeki-----	STONY MAHOGANY SAVANNA	Rangeland	R028AY058NV
2432: 40%-Majorsplace-----	SHALLOW CALCAREOUS HILL 10-14 P.Z.	Rangeland	R028AY102NV
30%-Checkett-----	SHALLOW CALCAREOUS LOAM 10-14 P.Z.	Rangeland	R028AY043NV
15%-Grube-----	SHALLOW LOAM 10-14 P.Z.	Rangeland	R028AY064NV
4%-Grandeposit-----	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata-Achnatherum hymenoides	Forestland	F028AY074NV
3%-Tractuff-----	Pinus monophylla/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa fendleriana	Forestland	F028AY076NV
3344: 60%-Badena-----	SHALLOW LOAM 10-14 P.Z.	Rangeland	R028AY064NV
25%-Badena-----	LOAMY 10-12 P.Z.	Rangeland	R028AY095NV
4%-Chainlink-----	SHALLOW CALCAREOUS LOAM 10-14 P.Z.	Rangeland	R028AY043NV
3%-Tractuff-----	Pinus monophylla/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa fendleriana	Forestland	F028AY076NV
2%-Badhap-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
2%-Hackwood-----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex	Forestland	F028AY056NV
2%-Huilepass-----	LOAMY 8-10 P.Z.	Rangeland	R028AY015NV
1%-Lehmandow-----	WET MEADOW	Rangeland	R028AY072NV
1%-Ripcon-----	Populus angustifolia/Salix-Betula occidentalis/Carex	Forestland	F028AY079NV
3439: 45%-Eaglepass-----	LIMESTONE HILL	Rangeland	R028AY029NV
15%-Amtoft-----	SHALLOW CALCAREOUS HILL 10-14 P.Z.	Rangeland	R028AY102NV
7%-Monarch-----	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa	Forestland	F028AY077NV
5%-Logring-----	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata-Achnatherum hymenoides	Forestland	F028AY074NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
3%-Lodar-----	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata-Achnatherum hymenoides	Forestland	F028AY074NV
3900: 85%-Osditch-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
3%-Berrycreek-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus- Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV
3%-Jonlake-----	CLAYPAN 14+ P.Z.	Rangeland	R028AY061NV
2%-Topeki-----	STONY MAHOGANY SAVANNA	Rangeland	R028AY058NV
1%-Keyole-----	Picea engelmannii/Ribes montigenum/Bromus marginatus- Achnatherum nelsonii ssp. nelsonii	Forestland	F028AY083NV
4140: 35%-Lodar-----	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata-Achnatherum hymenoides	Forestland	F028AY074NV
30%-Monarch-----	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa	Forestland	F028AY077NV
20%-Highup-----	STONY MAHOGANY SAVANNA	Rangeland	R028AY058NV
4%-Radol-----	SHALLOW CALCAREOUS HILL 10-14 P.Z.	Rangeland	R028AY102NV
3%-Zarark-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
4200: 50%-Wardbay-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
20%-Haunchee-----	STONY MAHOGANY SAVANNA	Rangeland	R028AY058NV
15%-Muiral-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
5%-Badhap-----	LOAMY SLOPE 16+ P.Z.	Rangeland	R028AY068NV
4%-Brokit-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus- Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV
3%-Pinwheeler-----	CLAYPAN 14+ P.Z.	Rangeland	R028AY061NV
1%-Timmercreek family-----	ASPEN THICKET	Rangeland	R028AY073NV
5100: 45%-Logring-----	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata-Achnatherum hymenoides	Forestland	F028AY074NV
25%-Hyzen-----	LIMESTONE HILL	Rangeland	R028AY029NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
15%-Canyoung-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
6%-Millan-----	SHALLOW LOAM 10-14 P.Z.	Rangeland	R028AY064NV
5102:			
40%-Canyoung-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
30%-Zarark-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
20%-Wardbay-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
3%-Hyzen-----	LIMESTONE HILL	Rangeland	R028AY029NV
2%-Millan-----	SHALLOW LOAM 10-14 P.Z.	Rangeland	R028AY064NV
1%-Amtoft-----	SHALLOW CALCAREOUS SLOPE 10-14 P.Z.	Rangeland	R028AY034NV
5110:			
45%-Garnel-----	Pinus monophylla/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa fendleriana	Forestland	F028AY076NV
30%-Garnel, very steep-----	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa	Forestland	F028AY077NV
5%-Jonlake-----	CLAYPAN 14+ P.Z.	Rangeland	R028AY061NV
5%-Kiouss-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
5140:			
45%-Wardbay-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
25%-Canyoung-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
5%-Amtoft-----	SHALLOW CALCAREOUS SLOPE 10-14 P.Z.	Rangeland	R028AY034NV
5%-Hardol-----	MAHOGANY THICKET	Rangeland	R028AY060NV
5%-Wardbay-----	CALCAREOUS LOAM 14+ P.Z.	Rangeland	R028AY067NV
5160:			
65%-Hyzen-----	LIMESTONE HILL	Rangeland	R028AY029NV
6%-Lodar-----	Pinus monophylla-Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata-Achnatherum hymenoides	Forestland	F028AY074NV
5%-Canyoung-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
4%-Hardol-----	MAHOGANY THICKET	Rangeland	R028AY060NV
5210:			
35%-Badhap-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
25%-Badhap-----	LOAMY 16+ P.Z.	Rangeland	R028AY057NV
25%-Topeki-----	STONY MAHOGANY SAVANNA	Rangeland	R028AY058NV
8%-Jonlake-----	CLAYPAN 14+ P.Z.	Rangeland	R028AY061NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
3%-Berrycreek-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV
2%-Osditch-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
5220: 60%-Basinpeak-----	CLAYPAN 14+ P.Z.	Rangeland	R028AY061NV
25%-Badhap-----	LOAMY SLOPE 16+ P.Z.	Rangeland	R028AY068NV
8%-Badhap-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
5%-Topeki-----	STONY MAHOGANY SAVANNA	Rangeland	R028AY058NV
2%-Berrycreek-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV
5240: 35%-Haunchee-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
35%-Wardbay-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
15%-Bakerpeak-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
5%-Bricone-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa	Forestland	F028AY081NV
4%-Badhap-----	LOAMY SLOPE 16+ P.Z.	Rangeland	R028AY068NV
2%-Brokit-----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex	Forestland	F028AY056NV
5241: 40%-Haunchee-----	STONY MAHOGANY SAVANNA	Rangeland	R028AY058NV
30%-Canyoung-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
4%-Wardbay-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
3%-Bakerpeak-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
3%-Brokit-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV
5250: 55%-Bricone-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa	Forestland	F028AY081NV
15%-Linpeak-----	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii	Forestland	F028AY084NV
15%-Piar-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa	Forestland	F028AY082NV
5%-Bakerpeak-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
4%-Windwash-----	CALCAREOUS ALPINE RIDGE	Rangeland	R028AY070NV
2%-Timmercrek family-----	ASPEN THICKET	Rangeland	R028AY073NV
5251: 50%-Bricone-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa	Forestland	F028AY081NV
20%-Piar-----	Picea engelmannii/Ribes montigenum/Bromus marginatus- Achnatherum nelsonii ssp. nelsonii	Forestland	F028AY083NV
3%-Linpeak-----	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii	Forestland	F028AY084NV
3%-Piar-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa	Forestland	F028AY082NV
3%-Timmercrek family-----	ASPEN THICKET	Rangeland	R028AY073NV
2%-Bakerpeak-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
5252: 60%-Bricone-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa	Forestland	F028AY081NV
5%-Hyzen-----	LIMESTONE HILL	Rangeland	R028AY029NV
5%-Monarch-----	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa	Forestland	F028AY077NV
5253: 40%-Windwash-----	CALCAREOUS ALPINE RIDGE	Rangeland	R028AY070NV
30%-Bricone-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa	Forestland	F028AY081NV
4%-Piar-----	Picea engelmannii/Ribes montigenum/Bromus marginatus- Achnatherum nelsonii ssp. nelsonii	Forestland	F028AY083NV
3%-Timmercrek family-----	ASPEN THICKET	Rangeland	R028AY073NV
2%-Windwash-----	ALPINE SLOPE	Rangeland	R028AY071NV
5255: 90%-Wayhigh-----	ALPINE MEADOW	Rangeland	R028AY129NV
6%-Windwash-----	CALCAREOUS ALPINE RIDGE	Rangeland	R028AY070NV
4%-Wheelerpek-----	ALPINE RIDGE	Rangeland	R028AY069NV
5261: 45%-Jonlake-----	CLAYPAN 14+ P.Z.	Rangeland	R028AY061NV
25%-Badhap-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
15%-Berrycreek-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus- Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
6%-Topeki-----	STONY MAHOGANY SAVANNA	Rangeland	R028AY058NV
4%-Badhap-----	LOAMY SLOPE 16+ P.Z.	Rangeland	R028AY068NV
2%-Rippo-----	Pinus ponderosa var. scopulorum/Salix/Carex nebrascensis	Forestland	F028AY128NV
1%-Brokit-----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa- Carex	Forestland	F028AY056NV
5270:			
40%-Bakerpeak-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
35%-Canyoung-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
3%-Hardol-----	MAHOGANY THICKET	Rangeland	R028AY060NV
2%-Bricone-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa	Forestland	F028AY081NV
2%-Timmercreek family-----	ASPEN THICKET	Rangeland	R028AY073NV
1%-Brokit-----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa- Carex	Forestland	F028AY056NV
1%-Ripcon-----	Populus angustifolia/Salix- Betula occidentalis/Carex	Forestland	F028AY079NV
1%-Wardbay-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
5290:			
40%-Keyole-----	Picea engelmannii/Ribes montigenum/Bromus marginatus- Achnatherum nelsonii ssp. nelsonii	Forestland	F028AY083NV
25%-Osditch-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
20%-Topeki-----	STONY MAHOGANY SAVANNA	Rangeland	R028AY058NV
4%-Keyole-----	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii	Forestland	F028AY084NV
3%-Wheelerpek-----	ALPINE RIDGE	Rangeland	R028AY069NV
1%-Berrycreek-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus- Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV
1%-Brokit-----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa- Carex	Forestland	F028AY056NV
1%-Timmercreek family-----	ASPEN THICKET	Rangeland	R028AY073NV
5291:			
50%-Keyole-----	Picea engelmannii/Ribes montigenum/Bromus marginatus- Achnatherum nelsonii ssp. nelsonii	Forestland	F028AY083NV
6%-Wheelerpek-----	ALPINE RIDGE	Rangeland	R028AY069NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
5%-Keyole-----	<i>Picea engelmannii</i> / <i>Ribes montigenum</i> / <i>Poa cusickii</i> ssp. <i>epilis</i> - <i>Carex rossii</i>	Forestland	F028AY084NV
5292: 50%-Keyole-----	<i>Picea engelmannii</i> / <i>Ribes montigenum</i> / <i>Bromus marginatus</i> - <i>Achnatherum nelsonii</i> ssp. <i>nelsonii</i>	Forestland	F028AY083NV
35%-Osditch-----	<i>Abies concolor</i> - <i>Pseudotsuga menziesii</i> / <i>Mahonia repens</i> / <i>Poa</i>	Forestland	F028AY080NV
5%-Berrycreek-----	<i>Populus tremuloides</i> - <i>Picea engelmannii</i> / <i>Symphoricarpos oreophilus</i> / <i>Bromus marginatus</i> - <i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>	Forestland	F028AY078NV
5%-Keyole-----	<i>Picea engelmannii</i> / <i>Ribes montigenum</i> / <i>Poa cusickii</i> ssp. <i>epilis</i> - <i>Carex rossii</i>	Forestland	F028AY084NV
3%-Topeki-----	STONY MAHOGANY SAVANNA	Rangeland	R028AY058NV
5310: 55%-Jumble-----	<i>Picea engelmannii</i> / <i>Ribes montigenum</i> / <i>Bromus marginatus</i> - <i>Achnatherum nelsonii</i> ssp. <i>nelsonii</i>	Forestland	F028AY083NV
30%-Lemcave-----	<i>Abies concolor</i> - <i>Pseudotsuga menziesii</i> / <i>Mahonia repens</i> / <i>Poa</i>	Forestland	F028AY080NV
7%-Ceebee-----	<i>Picea engelmannii</i> / <i>Ribes montigenum</i> / <i>Poa cusickii</i> ssp. <i>epilis</i> - <i>Carex rossii</i>	Forestland	F028AY084NV
6%-Timmercreek-----	<i>Populus tremuloides</i> - <i>Picea engelmannii</i> / <i>Symphoricarpos oreophilus</i> / <i>Bromus marginatus</i> - <i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>	Forestland	F028AY078NV
2%-Brokit-----	<i>Populus tremuloides</i> - <i>Abies concolor</i> / <i>Rosa woodsii</i> / <i>Poa</i> - <i>Carex</i>	Forestland	F028AY056NV
5311: 40%-Jumble-----	<i>Picea engelmannii</i> / <i>Ribes montigenum</i> / <i>Bromus marginatus</i> - <i>Achnatherum nelsonii</i> ssp. <i>nelsonii</i>	Forestland	F028AY083NV
30%-Lemcave-----	<i>Abies concolor</i> - <i>Pseudotsuga menziesii</i> / <i>Mahonia repens</i> / <i>Poa</i>	Forestland	F028AY080NV
15%-Gaia-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
4%-Ceebee-----	<i>Picea engelmannii</i> / <i>Ribes montigenum</i> / <i>Poa cusickii</i> ssp. <i>epilis</i> - <i>Carex rossii</i>	Forestland	F028AY084NV
3%-Brokit-----	<i>Populus tremuloides</i> - <i>Picea engelmannii</i> / <i>Symphoricarpos oreophilus</i> / <i>Bromus marginatus</i> - <i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>	Forestland	F028AY078NV
2%-Badhap-----	LOAMY SLOPE 16+ P.Z.	Rangeland	R028AY068NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
1%-Guiser-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa	Forestland	F028AY081NV
1%-Lehmandow-----	WET MEADOW	Rangeland	R028AY072NV
1%-Piar-----	Picea engelmannii/Ribes montigenum/Bromus marginatus- Achnatherum nelsonii ssp. nelsonii	Forestland	F028AY083NV
1%-Timmercreek family-----	ASPEN THICKET	Rangeland	R028AY073NV
5320:			
40%-Wardbay-----	CALCAREOUS LOAM 14+ P.Z.	Rangeland	R028AY067NV
30%-Wardbay, convex slopes-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
20%-Basinpeak-----	CLAYPAN 14+ P.Z.	Rangeland	R028AY061NV
5%-Canyoung-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
2%-Timmercreek family-----	ASPEN THICKET	Rangeland	R028AY073NV
5330:			
30%-Wheelerpek-----	ALPINE RIDGE	Rangeland	R028AY069NV
25%-Cobblywheel-----	ALPINE RIDGE	Rangeland	R028AY069NV
2%-Bricone-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa	Forestland	F028AY081NV
2%-Keyole-----	Picea engelmannii/Ribes montigenum/Bromus marginatus- Achnatherum nelsonii ssp. nelsonii	Forestland	F028AY083NV
1%-Timmercreek family-----	ASPEN THICKET	Rangeland	R028AY073NV
1%-Wayhigh-----	ALPINE MEADOW	Rangeland	R028AY129NV
5340:			
50%-Linpeak-----	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii	Forestland	F028AY084NV
20%-Piar-----	Picea engelmannii/Ribes montigenum/Bromus marginatus- Achnatherum nelsonii ssp. nelsonii	Forestland	F028AY083NV
15%-Bricone-----	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii-Poa	Forestland	F028AY081NV
2%-Timmercreek family-----	ASPEN THICKET	Rangeland	R028AY073NV
5350:			
35%-Goodski-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
35%-Kiouss-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
15%-Snacreek-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus- Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV
7%-Badhap-----	LOAMY SLOPE 16+ P.Z.	Rangeland	R028AY068NV
2%-Basinpeak-----	MOUNTAIN RIDGE	Rangeland	R028AY062NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
2%-Strawbcrek-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
1%-Lehmandow-----	WET MEADOW	Rangeland	R028AY072NV
5380: 50%-Ceebee-----	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii	Forestland	F028AY084NV
40%-Strawbcrek-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
7%-Snacreek-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus- Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV
5381: 50%-Ceebee-----	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii	Forestland	F028AY084NV
40%-Pirapeak-----	Picea engelmannii/Ribes montigenum/Bromus marginatus- Achnatherum nelsonii ssp. nelsonii	Forestland	F028AY083NV
5%-Snacreek-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus- Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV
5410: 85%-Timmercrek-----	Populus tremuloides-Picea engelmannii/Symphoricarpos oreophilus/Bromus marginatus- Elymus trachycaulus ssp. trachycaulus	Forestland	F028AY078NV
6%-Wheelerpek-----	ALPINE SLOPE	Rangeland	R028AY071NV
5%-Timmercrek family-----	ASPEN THICKET	Rangeland	R028AY073NV
2%-Brokit-----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa- Carex	Forestland	F028AY056NV
2%-Jumble-----	Picea engelmannii/Ribes montigenum/Bromus marginatus- Achnatherum nelsonii ssp. nelsonii	Forestland	F028AY083NV
5420: 35%-Badhap-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
35%-Topeki-----	STONY MAHOGANY SAVANNA	Rangeland	R028AY058NV
15%-Jonlake-----	CLAYPAN 14+ P.Z.	Rangeland	R028AY061NV
5%-Hardol-----	MAHOGANY THICKET	Rangeland	R028AY060NV
4%-Badhap-----	LOAMY 16+ P.Z.	Rangeland	R028AY057NV
3%-Osditch-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
1%-Ripcon-----	Populus angustifolia/Salix- Betula occidentalis/Carex	Forestland	F028AY079NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
5425:			
40%-Ripcon-----	Populus angustifolia/Salix- Betula occidentalis/Carex	Forestland	F028AY079NV
30%-Bigwash-----	LOAMY BOTTOM 14+ P.Z.	Rangeland	R028AY055NV
15%-Glideski-----	LOAMY 12-14 P.Z.	Rangeland	R028AY092NV
5%-Ravendog-----	LOAMY FAN 10-14 P.Z.	Rangeland	R028AY091NV
3%-Devilsgait-----	Populus angustifolia/Salix- Betula occidentalis/Carex	Forestland	F028AY079NV
3%-Lehmandow-----	WET MEADOW	Rangeland	R028AY072NV
2%-Washover-----	LOAMY FAN PIEDMONT 12-14 P.Z.	Rangeland	R028AY127NV
1%-Canyonfork-----	CALCAREOUS FAN PIEDMONT 10-14 P.Z.	Rangeland	R028AY087NV
1%-Chainlink-----	SHALLOW CALCAREOUS LOAM 10-14 P.Z.	Rangeland	R028AY043NV
5428:			
45%-Rippo-----	Pinus ponderosa var. scopulorum/Salix/Carex nebrascensis	Forestland	F028AY128NV
25%-Lehmandow-----	WET MEADOW	Rangeland	R028AY072NV
15%-Brokit-----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa- Carex	Forestland	F028AY056NV
7%-Devilsgait-----	Populus angustifolia/Salix- Betula occidentalis/Carex	Forestland	F028AY079NV
5%-Steptoe-----	STREAM TYPE B	Rangeland	R028BY103NV
3%-Ripcon-----	Populus angustifolia/Salix- Betula occidentalis/Carex	Forestland	F028AY079NV
5430:			
85%-Brokit-----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa- Carex	Forestland	F028AY056NV
5%-Brokit-----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa- Carex	Forestland	F028AY056NV
5%-Glideski-----	LOAMY 12-14 P.Z.	Rangeland	R028AY092NV
5%-Lehmandow-----	WET MEADOW	Rangeland	R028AY072NV
5432:			
35%-Glideski-----	LOAMY 12-14 P.Z.	Rangeland	R028AY092NV
30%-Brokit-----	Populus tremuloides-Abies concolor/Rosa woodsii/Poa- Carex	Forestland	F028AY056NV
20%-Lemcave-----	Abies concolor-Pseudotsuga menziesii/Mahonia repens/Poa	Forestland	F028AY080NV
5%-Lehmandow-----	WET MEADOW	Rangeland	R028AY072NV
3%-Cropper family-----	MAHOGANY SAVANNA	Rangeland	R028AY059NV
2%-Goodski-----	SHALLOW LOAM 14+ P.Z.	Rangeland	R028AY065NV
1%-Ripcon-----	Populus angustifolia/Salix- Betula occidentalis/Carex	Forestland	F028AY079NV

TABLE 7.--ECOLOGICAL SITE-SOIL CORRELATION

Map unit symbol component % and component name	Ecological site name	Ecological site type	Ecological site ID
5434:			
90%-Lehmandow-----	WET MEADOW	Rangeland	R028AY072NV
6%-Glideski-----	LOAMY 12-14 P.Z.	Rangeland	R028AY092NV
3%-Closkey-----	GRAVELLY LOAM 12-14 P.Z.	Rangeland	R028AY066NV
1%-Garnel-----	Pinus monophylla/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa fendleriana	Forestland	F028AY076NV
5440:			
9%-Wheelerpek-----	ALPINE RIDGE	Rangeland	R028AY069NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE

(Miscellaneous non-soil components are not displayed in this report. Component percents may not add up to 100%.)

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
1650: Noski-----	35	30-75	6824-7349	16-20	Fan piedmont	Fan remnant	Colluvium and residuum weathered from fanglomerate	SHALLOW CALCAREOUS HILL 10-14 P.Z., R028AY102NV
Cedarcabin-----	25	15-50	6824-7349	16-20		Fan remnant	Colluvium and residuum weathered from fanglomerate	Pinus monophylla- Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides, F028AY074NV
Noski-----	25	8-30	6824-7349	16-20		Fan remnant	Colluvium and residuum weathered from fanglomerate	SHALLOW CALCAREOUS HILL 10-14 P.Z., R028AY102NV
Chainlink-----	4	8-30	None assigned	None assigned		Ballena	Alluvium derived from limestone	SHALLOW CALCAREOUS SLOPE 10-14 P.Z., R028AY034NV
Monarch-----	3	15-50	None assigned	None assigned		Fan remnant	Colluvium and residuum from limestone, shale, and fanglomerate	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata- Poa, F028AY077NV
Canyonfork-----	3	4-15	None assigned	None assigned		Young alluvial fan	Alluvium derived from fanglomerate, limestone, dolomite, and quartzite	CALCAREOUS FAN PIEDMONT 10-14 P.Z., R028AY087NV
1652: Noski-----	35	15-50	6463-7579	16-20	Fan piedmont	Fan remnant	Colluvium and residuum weathered from fanglomerate	SHALLOW CALCAREOUS HILL 10-14 P.Z., R028AY102NV
Canyonfork-----	30	4-15	6463-7579	16-20		Young alluvial fan	Alluvium derived from fanglomerate, limestone, dolomite, and quartzite	CALCAREOUS FAN PIEDMONT 10-14 P.Z., R028AY087NV
Cedarcabin-----	25	15-30	6463-7579	16-20		Fan remnant	Colluvium and residuum weathered from fanglomerate	Pinus monophylla- Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata-

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				Achnatherum hymenoides, F028AY074NV
Ravendog-----	7	2-8	None assigned	None assigned		Inset fan	Alluvium derived from mixed rock sources	LOAMY FAN 10-14 P.Z., R028AY091NV
1700: Eenreed-----	40	4-15	6594-7513	12-18	Fan piedmont	Fan remnant	Alluvium derived from quartzite, shale and limestone	SHALLOW CALCAREOUS LOAM 10-14 P.Z., R028AY043NV
Millan-----	30	15-50	6594-7513	12-16		Fan remnant	Alluvium derived dominantly from quartzite with minor amounts of limestone and granite	SHALLOW LOAM 10-14 P.Z., R028AY064NV
Eenreed-----	15	15-50	6594-7513	12-18		Fan remnant	Alluvium derived from quartzite, shale and limestone	SHALLOW CALCAREOUS SLOPE 10-14 P.Z., R028AY034NV
Amtoft-----	4	15-50	None assigned	None assigned		Upper fan remnant	Residuum weathered from limestone, sandstone, and shale	SHALLOW CALCAREOUS SLOPE 10-14 P.Z., R028AY034NV
Borvant-----	3	4-30	None assigned	None assigned		Fan remnant	Alluvium and colluvium derived from limestone	SHALLOW CALCAREOUS LOAM 10-14 P.Z., R028AY043NV
Jericho-----	3	15-30	None assigned	None assigned		Upper partial ballena	Alluvium derived from igneous rocks	SHALLOW CALCAREOUS SLOPE 8-10 P.Z., R028AY004NV
Badena-----	3	2-8	None assigned	None assigned		Upper fan remnant	Alluvium derived from quartzite	LOAMY 10-12 P.Z., R028AY095NV
Basinpeak-----	2	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite and granite	CLAYPAN 14+ P.Z., R028AY061NV
1900: Borvant-----	90	4-30	6201-7611	12-16	Fan piedmont	Fan remnant	Alluvium and colluvium derived from limestone	SHALLOW CALCAREOUS LOAM 10-14 P.Z., R028AY043NV
Badena-----	5	2-8	None assigned	None assigned		Upper fan remnant	Alluvium derived from quartzite	LOAMY 10-12 P.Z., R028AY095NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Closkey-----	3	4-30	None assigned	None assigned		Fan remnant	Colluvium and residuum derived from granite	GRAVELLY LOAM 12-14 P.Z., R028AY066NV
Ripcon-----	2	2-15	None assigned	None assigned		Drainageway	Alluvium derived from limestone, dolomite, quartzite, and granite	Populus angustifolia/Salix- Betula occidentalis/Carex, F028AY079NV
2000: Closkey-----	85	4-30	6398-8727	16-20	Mountains	Rock pediment	Colluvium and residuum derived from granite	GRAVELLY LOAM 12-14 P.Z., R028AY066NV
Badhap-----	6	15-30	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	LOAMY SLOPE 16+ P.Z., R028AY068NV
Borvant-----	4	4-30	None assigned	None assigned		Lower mountain	Alluvium and colluvium derived from limestone	SHALLOW CALCAREOUS SLOPE 10-14 P.Z., R028AY034NV
Kious-----	3	30-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from granite	MAHOGANY SAVANNA, R028AY059NV
Basinpeak-----	2	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite and granite	CLAYPAN 14+ P.Z., R028AY061NV
2101: Radol-----	40	30-75	6726-9088	12-14	Mountains	Mountain	Colluvium derived from limestone and dolomite and residuum weathered from limestone and dolomite	SHALLOW CALCAREOUS HILL 10-14 P.Z., R028AY102NV
Logring-----	25	30-75	6726-9088	10-14		Mountain	Colluvium and residuum derived from limestone	Pinus monophylla- Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides, F028AY074NV
Eenreed-----	6	8-30	None assigned	None assigned		Fan remnant	Alluvium derived from quartzite, shale and limestone	SHALLOW CALCAREOUS SLOPE 10-14 P.Z., R028AY034NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Hopeka-----	5	30-75	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone	LIMESTONE HILL, R028AY029NV
Canyoung-----	3	15-50	None assigned	None assigned		Mountain	Colluvium derived from limestone, dolomite and calcareous shale	MAHOGANY SAVANNA, R028AY059NV
Ripcon-----	1	2-15	None assigned	None assigned		Drainageway	Alluvium derived from limestone, dolomite, quartzite, and granite	Populus angustifolia/Salix- Betula occidentalis/Carex, F028AY079NV
Radol-----	40	30-75	6234-9022	12-14	Mountains	Mountain	Colluvium derived from limestone and dolomite and residuum weathered from limestone and dolomite	SHALLOW CALCAREOUS HILL 10-14 P.Z., R028AY102NV
Hyzen-----	30	15-50	6234-9022	12-16		Mountain	Colluvium and residuum derived from limestone and dolomite	LIMESTONE HILL, R028AY029NV
Grandeposit-----	4	4-30	None assigned	None assigned		Mountain	Colluvium derived from quartzite and slate over residuum weathered from quartzite and slate	Pinus monophylla- Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides, F028AY074NV
Borvant-----	3	4-30	None assigned	None assigned		Fan remnant	Alluvium and colluvium derived from limestone	SHALLOW CALCAREOUS LOAM 10-14 P.Z., R028AY043NV
Ripcon-----	2	2-8	None assigned	None assigned		Drainageway	Alluvium derived from limestone, dolomite, quartzite, and granite	Populus angustifolia/Salix- Betula occidentalis/Carex, F028AY079NV
Osditch-----	1	30-75	None assigned	None assigned		Mountain	Colluvium derived from quartzite and argillite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
2111: Garnel-----	70	30-75	6529-8071	16-20	Mountains	Mountain	Colluvium and residuum derived from granite	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata- Poa, F028AY077NV
Closkey-----	5	4-30	None assigned	None assigned		Rock pediment	Colluvium and residuum derived from granite	GRAVELLY LOAM 12-14 P.Z., R028AY066NV
2430: Bellenmine-----	70	8-30	7087-8497	16-20	Mountains	Mountain	Colluvium and residuum derived from quartzite	Pinus monophylla- Juniperus osteosperma/Artemisia arbuscula/Pseudoroegneri a spicata ssp. spicata- Poa fendleriana, F028AY075NV
Basinpeak-----	15	15-50	7087-8497	18-28		Mountain	Colluvium and residuum derived from quartzite and granite	CLAYPAN 14+ P.Z., R028AY061NV
Osditch-----	5	30-75	None assigned	None assigned		Mountain	Colluvium derived from quartzite and argillite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Brokit-----	4	8-15	None assigned	None assigned		Mountain	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Picea engelmannii/Symphoricar- pa oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Topeki-----	4	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	STONY MAHOGANY SAVANNA, R028AY058NV
2432: Majorsplace-----	40	8-30	6365-7644	10-16	Mountains	Mountain	Colluvium and residuum weathered from quartzite with minor amounts of calcareous loess	SHALLOW CALCAREOUS HILL 10-14 P.Z., R028AY102NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Checkett-----	30	15-50	6365-7644	8-12		Mountain	Colluvium and residuum derived from igneous and metamorphic rock	SHALLOW CALCAREOUS LOAM 10-14 P.Z., R028AY043NV
Grube-----	15	15-50	6365-7644	12-14		Mountain	Colluvium derived from quartzite	SHALLOW LOAM 10-14 P.Z., R028AY064NV
Grandeposit-----	4	15-50	None assigned	None assigned		Mountain	Colluvium derived from quartzite and slate over residuum weathered from quartzite and slate	Pinus monophylla- Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides, F028AY074NV
Tractuff-----	3	30-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	Pinus monophylla/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa fendleriana, F028AY076NV
3344: Badena-----	60	4-30	6562-8235	10-14	Outwash plain	Outwash fan	Alluvium derived from quartzite	SHALLOW LOAM 10-14 P.Z., R028AY064NV
Badena-----	25	8-30	6562-8235	10-14		Outwash fan	Alluvium derived from quartzite	LOAMY 10-12 P.Z., R028AY095NV
Chainlink-----	4	4-8	None assigned	None assigned		Fan remnant	Alluvium derived from limestone	SHALLOW CALCAREOUS LOAM 10-14 P.Z., R028AY043NV
Tractuff-----	3	30-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	Pinus monophylla/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa fendleriana, F028AY076NV
Huilepass-----	2	4-15	None assigned	None assigned		Sideslopes barrier beach	Alluvium derived from quartzite	LOAMY 8-10 P.Z., R028AY015NV
Badhap-----	2	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Hackwood-----	2	15-50	None assigned	None assigned		Mountain	Alluvium and colluvium derived from mixed rocks	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex, F028AY056NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Ripcon-----	1	4-15	None assigned	None assigned		Drainageway	Alluvium derived from limestone, dolomite, quartzite, and granite	Populus angustifolia/Salix- Betula occidentalis/Carex, F028AY079NV
Lehmandow-----	1	0-2	None assigned	None assigned		Stream terrace	Alluvium derived from quartzite, limestone, and granite over till derived from quartzite, limestone and granite	WET MEADOW, R028AY072NV
3439: Eaglepass-----	45	15-50	6201-6365	8-12	Mountains	Mountain	Colluvium and residuum derived from limestone and dolomite	LIMESTONE HILL, R028AY029NV
Amtoft-----	15	4-30	6201-6365	10-12		Mountain	Residuum weathered from limestone, sandstone, and shale	SHALLOW CALCAREOUS HILL 10-14 P.Z., R028AY102NV
Monarch-----	7	15-50	None assigned	None assigned		Mountain	Colluvium and residuum from limestone, shale, and fanglomerate	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata- Poa, F028AY077NV
Logring-----	5	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone	Pinus monophylla- Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides, F028AY074NV
Lodar-----	3	8-30	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone	Pinus monophylla- Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides, F028AY074NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
3900: Osditch-----	85	30-75	8104-10170	18-28	Mountains	Mountain	Colluvium derived from quartzite and argillite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Berrycreek-----	3	15-50	None assigned	None assigned		Mountain	Colluvium and residuum weathered from quartzite	Populus tremuloides-Picea engelmannii/Symphoricar- p os oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Jonlake-----	3	8-30	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite with local mixtures of argillite	CLAYPAN 14+ P.Z., R028AY061NV
Topeki-----	2	30-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	STONY MAHOGANY SAVANNA, R028AY058NV
Keyole-----	1	30-75	None assigned	None assigned		Mountain	Colluvium derived from quartzite	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
4140: Lodar-----	35	15-50	7382-8596	12-16	Mountains	Mountain	Colluvium and residuum derived from limestone	Pinus monophylla- Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides, F028AY074NV
Monarch-----	30	30-75	7382-8596	12-16		Mountain	Colluvium and residuum from limestone, shale, and fanglomerate	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata- Poa, F028AY077NV
Highup-----	20	30-75	7382-8596	16-24		Upper mountain	Colluvium and residuum derived from limestone	STONY MAHOGANY SAVANNA, R028AY058NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Radol-----	4	8-35	None assigned	None assigned		Mountain	Colluvium derived from limestone and dolomite and residuum weathered from limestone and dolomite	SHALLOW CALCAREOUS HILL 10-14 P.Z., R028AY102NV
Zarark-----	3	30-50	None assigned	18-28		Mountain	Residuum and colluvium derived from limestone	MAHOGANY SAVANNA, R028AY059NV
4200: Wardbay-----	50	15-50	7808-9941	18-28	Mountains	Mountain	Residuum and colluvium derived from limestone and dolomite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Haunchee-----	20	15-50	7808-9941	16-20		Mountain	Residuum and colluvium derived from limestone and dolomite	STONY MAHOGANY SAVANNA, R028AY058NV
Muiral-----	15	15-75	7808-9941	16-18		Mountain	Residuum and colluvium derived from limestone and dolomite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Badhap-----	5	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	LOAMY SLOPE 16+ P.Z., R028AY068NV
Brokit-----	4	8-30	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Picea engelmannii/Symphoricar- pa oreophila/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Pinwheeler-----	3	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from granite	CLAYPAN 14+ P.Z., R028AY061NV
Timmercrek family--	1	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and/or quartzite	ASPEN THICKET, R028AY073NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
5100: Logring-----	45	30-75	6758-8005	12-14	Mountains	Mountain	Residuum and colluvium derived from limestone	Pinus monophylla- Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides, F028AY074NV
Hyzen-----	25	15-50	6758-8530	12-16		Mountain	Colluvium and residuum derived from limestone and dolomite	LIMESTONE HILL, R028AY029NV
Canyoung-----	15	15-50	6758-8530	18-24		Mountain	Colluvium derived from limestone, dolomite and calcareous shale	MAHOGANY SAVANNA, R028AY059NV
Millan-----	6	15-50	None assigned	None assigned		Fan remnant	Alluvium derived dominantly from quartzite with minor amounts of limestone and granite	SHALLOW LOAM 10-14 P.Z., R028AY064NV
5102: Canyoung-----	40	4-15	7447-8432	18-28	Mountains	Mountain	Colluvium derived from limestone, dolomite and calcareous shale	MAHOGANY SAVANNA, R028AY059NV
Zarark-----	30	4-15	7447-8432	18-28		Mountain	Residuum and colluvium derived from limestone	MAHOGANY SAVANNA, R028AY059NV
Wardbay-----	20	15-30	7447-8432	18-28		Mountain	Residuum and colluvium derived from limestone and dolomite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Hyzen-----	3	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and dolomite	LIMESTONE HILL, R028AY029NV
Millan-----	2	15-50	None assigned	None assigned		Fan remnant	Alluvium derived dominantly from quartzite with minor amounts of limestone and granite	SHALLOW LOAM 10-14 P.Z., R028AY064NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Amtoft-----	1	15-50	None assigned	None assigned		Mountain	Residuum weathered from limestone, sandstone, and shale	SHALLOW CALCAREOUS SLOPE 10-14 P.Z., R028AY034NV
5110: Garnel-----	45	8-30	6791-8661	16-20	Mountains	Mountain	Colluvium and residuum derived from granite	Pinus monophylla/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa fendleriana, F028AY076NV
Garnel, very steep-	30	30-75	6791-8661	16-20		Mountain	Colluvium and residuum derived from granite	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata- Poa, F028AY077NV
Jonlake-----	5	8-30	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite with local mixtures of argillite	CLAYPAN 14+ P.Z., R028AY061NV
Kious-----	5	15-50	None assigned	None assigned		Upper mountain	Colluvium and residuum derived from granite	MAHOGANY SAVANNA, R028AY059NV
5140: Wardbay-----	45	8-30	6824-9186	18-28	Mountains	Mountain	Residuum and colluvium derived from limestone and dolomite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Canyoung-----	25	30-75	6824-9186	18-28		Mountain	Colluvium derived from limestone, dolomite and calcareous shale	MAHOGANY SAVANNA, R028AY059NV
Wardbay-----	5	30-75	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone and dolomite	CALCAREOUS LOAM 14+ P.Z., R028AY067NV
Amtoft-----	5	30-75	None assigned	None assigned		Mountain	Residuum weathered from limestone, sandstone, and shale	SHALLOW CALCAREOUS SLOPE 10-14 P.Z., R028AY034NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Hardol-----	5	30-75	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone and dolomite	MAHOGANY THICKET, R028AY060NV
5160: Hyzen-----	65	30-75	7415-10597	12-16	Mountains	Mountain	Colluvium and residuum derived from limestone and dolomite	LIMESTONE HILL, R028AY029NV
Lodar-----	6	50-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone	Pinus monophylla- Juniperus osteosperma/Artemisia nova/Pseudoroegneria spicata ssp. spicata- Achnatherum hymenoides, F028AY074NV
Canyoung-----	5	30-75	None assigned	None assigned		Mountain	Colluvium derived from limestone, dolomite and calcareous shale	MAHOGANY SAVANNA, R028AY059NV
Hardol-----	4	50-75	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone and dolomite	MAHOGANY THICKET, R028AY060NV
5210: Badhap-----	35	30-75	7743-10499	16-20	Mountains	Mountain	Colluvium and residuum derived from quartzite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Badhap-----	25	15-50	7743-10499	16-20		Mountain	Colluvium and residuum derived from quartzite	LOAMY 16+ P.Z., R028AY057NV
Topeki-----	25	8-30	7743-10400	18-28		Mountain	Colluvium and residuum derived from quartzite	STONY MAHOGANY SAVANNA, R028AY058NV
Jonlake-----	8	8-30	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite with local mixtures of argillite	CLAYPAN 14+ P.Z., R028AY061NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Berrycreek-----	3	8-30	None assigned	None assigned		Mountain	Colluvium and residuum weathered from quartzite	Populus tremuloides-Picea engelmannii/Symphoricar- p os oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Osditch-----	2	15-50	None assigned	None assigned		Mountain	Colluvium derived from quartzite and argillite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
5220: Basinpeak-----	60	8-50	7546-9777	18-28		Mountain	Colluvium and residuum derived from quartzite and granite	CLAYPAN 14+ P.Z., R028AY061NV
Badhap-----	25	15-50	7546-9777	16-20		Mountain	Colluvium and residuum derived from quartzite	LOAMY SLOPE 16+ P.Z., R028AY068NV
Badhap-----	8	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Topeki-----	5	8-30	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	STONY MAHOGANY SAVANNA, R028AY058NV
Berrycreek-----	2	15-50	None assigned	None assigned		Mountain	Colluvium and residuum weathered from quartzite	Populus tremuloides-Picea engelmannii/Symphoricar- p os oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
5240: Wardbay-----	35	8-50	7808-10236	18-28	Mountains	Mountain	Residuum and colluvium derived from limestone and dolomite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Haunchee-----	35	15-50	7808-10236	16-20		Mountain	Residuum and colluvium derived from limestone and dolomite	MAHOGANY SAVANNA, R028AY059NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Bakerpeak-----	15	30-75	7808-10236	18-28		Mountain	Colluvium derived from limestone and shale	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Bricone-----	5	30-75	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone and dolomite	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii- Poa, F028AY081NV
Badhap-----	4	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	LOAMY SLOPE 16+ P.Z., R028AY068NV
Brokit-----	2	8-30	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex, F028AY056NV
5241: Haunchee-----	40	30-75	7710-9875	16-20	Mountains	Mountain	Residuum and colluvium derived from limestone and dolomite	STONY MAHOGANY SAVANNA, R028AY058NV
Canyoung-----	30	15-50	7710-9875	18-28		Mountain	Colluvium derived from limestone, dolomite and calcareous shale	MAHOGANY SAVANNA, R028AY059NV
Wardbay-----	4	15-50	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone and dolomite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Brokit-----	3	8-30	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Picea engelmannii/Symphoricar- p os oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Bakerpeak-----	3	30-75	None assigned	None assigned		Mountain	Colluvium derived from limestone and shale	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
5250: Bricone-----	55	30-75	7677-11253	24-37	Mountains	Mountain	Residuum and colluvium derived from limestone and dolomite	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii- Poa, F028AY081NV
Piar-----	15	30-75	8563-11253	24-37		Mountain	Colluvium and residuum from limestone and calcareous shale	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii- Poa, F028AY082NV
Linpeak-----	15	15-50	8005-11253	24-37		Mountain	Colluvium derived from limestone and calcareous shale	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii, F028AY084NV
Bakerpeak-----	5	30-75	None assigned	None assigned		Mountain	Colluvium derived from limestone and shale	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Windwash-----	4	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and dolomite	CALCAREOUS ALPINE RIDGE, R028AY070NV
Timmercrek family--	2	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and/or quartzite	ASPEN THICKET, R028AY073NV
Bricone-----	50	15-75	8071-11056	24-37	Mountains	Mountain	Residuum and colluvium derived from limestone and dolomite	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii- Poa, F028AY081NV
Piar-----	20	30-75	8563-11056	24-37		Mountain	Colluvium and residuum from limestone and calcareous shale	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
Timmercrek family--	3	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and/or quartzite	ASPEN THICKET, R028AY073NV
Piar-----	3	30-75	None assigned	None assigned		Higher elevations mountain	Colluvium and residuum from limestone and calcareous shale	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii- Poa, F028AY082NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Linpeak-----	3	30-75	None assigned	None assigned		Mountain	Colluvium derived from limestone and calcareous shale	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii, F028AY084NV
Bakerpeak-----	2	30-75	None assigned	None assigned		Mountain	Colluvium derived from limestone and shale	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
5252: Bricone-----	60	30-75	8038-10859	24-37	Mountains	Mountain	Residuum and colluvium derived from limestone and dolomite	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii- Poa, F028AY081NV
Hyzen-----	5	50-75	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone and dolomite	LIMESTONE HILL, R028AY029NV
Monarch-----	5	30-75	None assigned	None assigned		Mountain	Colluvium and residuum from limestone, shale, and fanglomerate	Pinus monophylla/Cercocarpus ledifolius-Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata- Poa, F028AY077NV
5253: Windwash-----	40	8-50	9088-11680	20-28	Mountains	Mountain	Colluvium and residuum derived from limestone and dolomite	CALCAREOUS ALPINE RIDGE, R028AY070NV
Bricone-----	30	30-75	9088-11680	24-37		Mountain	Residuum and colluvium derived from limestone and dolomite	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii- Poa, F028AY081NV
Piar-----	4	30-75	None assigned	None assigned		Mountain	Colluvium and residuum from limestone and calcareous shale	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
Timmercrek family--	3	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and/or quartzite	ASPEN THICKET, R028AY073NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Windwash-----	2	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and dolomite	ALPINE SLOPE, R028AY071NV
5255: Wayhigh-----	90	2-15	11089-11319	20-28	Mountains	Mountain	Colluvium derived from quartzite and residuum weathered from quartzite	ALPINE MEADOW, R028AY129NV
Windwash-----	6	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and dolomite	CALCAREOUS ALPINE RIDGE, R028AY070NV
Wheelerpek-----	4	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	ALPINE RIDGE, R028AY069NV
5261: Jonlake-----	45	30-75	7808-10499	18-28	Mountains	Mountain	Colluvium and residuum derived from quartzite with local mixtures of argillite	CLAYPAN 14+ P.Z., R028AY061NV
Badhap-----	25	15-50	7808-10499	16-20		Mountain	Colluvium and residuum derived from quartzite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Berrycreek-----	15	15-50	7808-10499	24-37		Mountain	Colluvium and residuum weathered from quartzite	Populus tremuloides-Picea engelmannii/Symphoricar- pa oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Topeki-----	6	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	STONY MAHOGANY SAVANNA, R028AY058NV
Badhap-----	4	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	LOAMY SLOPE 16+ P.Z., R028AY068NV
Rippo-----	2	8-15	None assigned	None assigned		Drainageway	Alluvium derived from limestone, dolomite, quartzite and granite	Pinus ponderosa var. scopulorum/Salix/Carex nebrascensis, F028AY128NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Brokit-----	1	4-8	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex, F028AY056NV
5270: Bakerpeak-----	40	30-75	7218-10925	18-28		Mountain	Colluvium derived from limestone and shale	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Canyoung-----	35	15-50	7218-10925	18-28		Mountain	Colluvium derived from limestone, dolomite and calcareous shale	MAHOGANY SAVANNA, R028AY059NV
Hardol-----	3	30-75	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone and dolomite	MAHOGANY THICKET, R028AY060NV
Timmercrek family--	2	8-30	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and/or quartzite	ASPEN THICKET, R028AY073NV
Bricone-----	2	30-75	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone and dolomite	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii- Poa, F028AY081NV
Wardbay-----	1	15-30	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone and dolomite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Brokit-----	1	4-8	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex, F028AY056NV
Ripcon-----	1	2-8	None assigned	None assigned		Drainageway	Alluvium derived from limestone, dolomite, quartzite, and granite	Populus angustifolia/Salix- Betula occidentalis/Carex, F028AY079NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
5290: Keyole-----	40	50-75	9383-11647	24-37	Mountains	Mountain	Colluvium derived from quartzite	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
Osditch-----	25	30-75	8136-9810	18-28		Mountain	Colluvium derived from quartzite and argillite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Topeki-----	20	30-50	8136-10400	18-28		Mountain	Colluvium and residuum derived from quartzite	STONY MAHOGANY SAVANNA, R028AY058NV
Keyole-----	4	30-75	None assigned	None assigned		Mountain	Colluvium derived from quartzite	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii, F028AY084NV
Wheelerpek-----	3	15-50	None assigned	None assigned		Higher elevation mountain	Colluvium and residuum derived from quartzite	ALPINE RIDGE, R028AY069NV
Berrycreek-----	1	15-50	None assigned	None assigned		Mountain	Colluvium and residuum weathered from quartzite	Populus tremuloides-Picea engelmannii/Symphoricar- pa oreophila/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Brokit-----	1	4-8	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex, F028AY056NV
Timmercreek family--	1	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and/or quartzite	ASPEN THICKET, R028AY073NV
5291: Keyole-----	50	30-75	9383-11581	24-37	Mountains	Mountain	Colluvium derived from quartzite	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Wheelerpek-----	6	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	ALPINE RIDGE, R028AY069NV
Keyole-----	5	30-75	None assigned	None assigned		Mountain	Colluvium derived from quartzite	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii, F028AY084NV
5292: Keyole-----	50	15-75	9383-11220	24-37	Mountains	Mountain	Colluvium derived from quartzite	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
Osditch-----	35	30-75	7382-9514	18-28		Lower elevation mountain	Colluvium derived from quartzite and argillite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Berrycreek-----	5	50-75	None assigned	None assigned		Mountain	Colluvium and residuum weathered from quartzite	Populus tremuloides-Picea engelmannii/Symphoricarp os oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Keyole-----	5	50-75	None assigned	None assigned		Mountain	Colluvium derived from quartzite	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii, F028AY084NV
Topeki-----	3	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	STONY MAHOGANY SAVANNA, R028AY058NV
5310: Jumble-----	55	8-50	9383-10564	24-37	Mountains	Higher elevation moraine	Till derived from quartzite	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
Lemcave-----	30	8-50	8268-9383	18-28		Lower elevation moraine	Till and outwash derived dominantly from quartzite and small amounts of granite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Ceebee-----	7	30-75	None assigned	None assigned		Mountain	Colluvium derived from granite	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii, F028AY084NV
Timmercrek-----	6	15-50	None assigned	None assigned		Higher elevation ground moraine	Till derived from quartzite, shale and argillite	Populus tremuloides-Picea engelmannii/Symphoricar- pos oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Brokit-----	2	4-8	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex, F028AY056NV
5311: Jumble-----	40	8-50	9383-11023	24-37	Mountains	Higher elevation moraine	Till derived from quartzite	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
Lemcave-----	30	8-50	7808-9383	18-28		Lower elevation moraine	Till and outwash derived dominantly from quartzite and small amounts of granite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Gaia-----	15	15-50	7808-11023	18-28		Lower elevation ground moraine	Till derived dominantly from quartzite and minor amounts of granite	MAHOGANY SAVANNA, R028AY059NV
Ceebee-----	4	30-75	None assigned	None assigned		Mountain	Colluvium derived from granite	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii, F028AY084NV
Brokit-----	3	8-30	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Picea engelmannii/Symphoricar- pos oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Badhap-----	2	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	LOAMY SLOPE 16+ P.Z., R028AY068NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Guiser-----	1	15-50	None assigned	None assigned		Mountain	Colluvium derived from quartzite and conglomerate	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii- Poa, F028AY081NV
Piar-----	1	15-50	None assigned	None assigned		Mountain	Colluvium and residuum from limestone and calcareous shale	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
Timmercrek family--	1	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and/or quartzite	ASPEN THICKET, R028AY073NV
Lehmandow-----	1	0-2	None assigned	None assigned		Stream terrace	Alluvium derived from quartzite, limestone, and granite over till derived from quartzite, limestone and granite	WET MEADOW, R028AY072NV
5320: Wardbay-----	40	30-75	8071-10367	18-28	Mountains	Mountain	Residuum and colluvium derived from limestone and dolomite	CALCAREOUS LOAM 14+ P.Z., R028AY067NV
Wardbay, convex slopes-----	30	30-75	8071-10367	18-28		Mountain	Residuum and colluvium derived from limestone and dolomite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Basinpeak-----	20	15-50	8071-10367	18-28		Mountain	Colluvium derived from limestone and residuum weathered from limestone	CLAYPAN 14+ P.Z., R028AY061NV
Canyoung-----	5	15-50	None assigned	None assigned		Mountain	Colluvium derived from limestone, dolomite and calcareous shale	MAHOGANY SAVANNA, R028AY059NV
Timmercrek family--	2	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and/or quartzite	ASPEN THICKET, R028AY073NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
5330: Wheelerpek-----	30	30-75	9350-13058	24-28		Mountain	Colluvium and residuum derived from quartzite	ALPINE RIDGE, R028AY069NV
Cobblywheel-----	25	15-50	9350-13058	35-43		Mountain	Colluvium and solifluction deposits derived from quartzite	ALPINE RIDGE, R028AY069NV
Keyole-----	2	30-75	None assigned	None assigned		Mountain	Colluvium derived from quartzite	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
Bricone-----	2	30-75	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone and dolomite	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii- Poa, F028AY081NV
Wayhigh-----	1	2-15	None assigned	None assigned		Mountain	Colluvium derived from quartzite and residuum weathered from quartzite	ALPINE MEADOW, R028AY129NV
Timmercrek family--	1	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and/or quartzite	ASPEN THICKET, R028AY073NV
5340: Linpeak-----	50	15-50	8563-11155	24-37	Mountains	Mountain	Colluvium derived from limestone and calcareous shale	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii, F028AY084NV
Piar-----	20	30-75	8563-11155	24-37		Mountain	Colluvium and residuum from limestone and calcareous shale	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
Bricone-----	15	30-75	8563-11155	24-37		Mountain	Residuum and colluvium derived from limestone and dolomite	Pinus longaeva-Pinus flexilis/Ribes-Juniperus communis/Carex rossii- Poa, F028AY081NV
Timmercrek family--	2	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and/or quartzite	ASPEN THICKET, R028AY073NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
5350: Goodski-----	35	8-50	7119-10499	18-28	Mountains	Mountain	Colluvium and residuum weathered from granite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Kious-----	35	30-75	7119-10499	18-28		Mountain	Colluvium and residuum derived from granite	MAHOGANY SAVANNA, R028AY059NV
Snacreek-----	15	8-50	7119-10499	24-37		Mountain	Colluvium and residuum from granite	Populus tremuloides-Picea engelmannii/Symphoricar- p os oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Badhap-----	7	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	LOAMY SLOPE 16+ P.Z., R028AY068NV
Strawberek-----	2	30-75	None assigned	None assigned		Mountain	Colluvium derived from granite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Basinpeak-----	2	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite and granite	MOUNTAIN RIDGE, R028AY062NV
Lehmandow-----	1	0-2	None assigned	None assigned		Stream terrace	Alluvium derived from quartzite, limestone, and granite over till derived from quartzite, limestone and granite	WET MEADOW, R028AY072NV
5380: Ceebee-----	50	30-75	7841-10695	24-37	Mountains	Mountain	Colluvium derived from granite	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii, F028AY084NV
Strawberek-----	40	30-75	7841-10695	18-28		Lower elevation mountain	Colluvium derived from granite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Snacreek-----	7	8-50	None assigned	None assigned		Mountain	Colluvium and residuum from granite	Populus tremuloides-Picea engelmannii/Symphoricar- p os oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
5381: Ceebee-----	50	30-75	9547-11516	24-37	Mountains	Mountain	Colluvium derived from granite	Picea engelmannii/Ribes montigenum/Poa cusickii ssp. epilis-Carex rossii, F028AY084NV
Pirapeak-----	40	30-75	9547-11516	24-37		Mountain	Colluvium derived from granite	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
Snacreek-----	5	8-50	None assigned	None assigned		Lower elevation mountain	Colluvium and residuum from granite	Populus tremuloides-Picea engelmannii/Symphoricar- p os oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
5410: Timmercrek-----	85	15-50	9482-11253	24-37	Mountains	Higher elevation ground moraine	Till derived from quartzite, shale and argillite	Populus tremuloides-Picea engelmannii/Symphoricar- p os oreophilus/Bromus marginatus-Elymus trachycaulus ssp. trachycaulus, F028AY078NV
Wheelerpek-----	6	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	ALPINE SLOPE, R028AY071NV
Timmercrek family--	5	30-75	None assigned	None assigned		Mountain	Colluvium and residuum derived from limestone and/or quartzite	ASPEN THICKET, R028AY073NV
Brokit-----	2	8-30	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex, F028AY056NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Jumble-----	2	15-50	None assigned	None assigned		Higher elevation moraine	Till derived from quartzite	Picea engelmannii/Ribes montigenum/Bromus marginatus-Achnatherum nelsonii ssp. nelsonii, F028AY083NV
5420: Topeki-----	35	15-50	6824-10006	18-28	Mountains	Mountain	Colluvium and residuum derived from quartzite	STONY MAHOGANY SAVANNA, R028AY058NV
Badhap-----	35	15-50	6824-10006	16-20		Mountain	Colluvium and residuum derived from quartzite	SHALLOW LOAM 14+ P.Z., R028AY065NV
Jonlake-----	15	8-30	6824-10006	18-28		Mountain	Colluvium and residuum derived from quartzite with local mixtures of argillite	CLAYPAN 14+ P.Z., R028AY061NV
Hardol-----	5	15-50	None assigned	None assigned		Mountain	Residuum and colluvium derived from limestone and dolomite	MAHOGANY THICKET, R028AY060NV
Badhap-----	4	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	LOAMY 16+ P.Z., R028AY057NV
Osditch-----	3	15-50	None assigned	None assigned		Higher elevation mountain	Colluvium derived from quartzite and argillite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Ripcon-----	1	2-15	None assigned	None assigned		Drainageway	Alluvium derived from limestone, dolomite, quartzite, and granite	Populus angustifolia/Salix- Betula occidentalis/Carex, F028AY079NV
5425: Ripcon-----	40	2-8	6201-7251	12-18	Mountains	Drainageway	Alluvium derived from limestone, dolomite, quartzite, and granite	Populus angustifolia/Salix- Betula occidentalis/Carex, F028AY079NV
Bigwash-----	30	4-8	6201-7251	16-20		Drainageway	Alluvium derived from limestone and minor amounts of quartzite	LOAMY BOTTOM 14+ P.Z., R028AY055NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Glideski-----	15	4-15	6201-7251	16-20	Mountains	Stream terrace	Alluvium and outwash derived from quartzite, granite, and limestone	LOAMY 12-14 P.Z., R028AY092NV
Ravendog-----	5	2-8	None assigned	None assigned		Inset fan	Alluvium derived from mixed rock sources	LOAMY FAN 10-14 P.Z., R028AY091NV
Devilsgait-----	3	0-2	None assigned	None assigned		Flood plain		Populus angustifolia/Salix- Betula occidentalis/Carex, F028AY079NV
Lehmandow-----	3	0-4	None assigned	None assigned		Stream terrace	Alluvium derived from quartzite, limestone, and granite over till derived from quartzite, limestone and granite	WET MEADOW, R028AY072NV
Washover-----	2	2-15	None assigned	None assigned		Young alluvial fan	Alluvium derived from fanglomerate consisting of limestone, dolomite, and quartzite	LOAMY FAN PIEDMONT 12-14 P.Z., R028AY127NV
Canyonfork-----	1	4-15	None assigned	None assigned		Young alluvial fan	Alluvium derived from fanglomerate, limestone, dolomite, and quartzite	CALCAREOUS FAN PIEDMONT 10-14 P.Z., R028AY087NV
Chainlink-----	1	4-8	None assigned	None assigned		Fan remnant	Alluvium derived from limestone	SHALLOW CALCAREOUS LOAM 10-14 P.Z., R028AY043NV
5428: Rippo-----	45	4-15	7382-9022	16-20	Mountains	Drainageway	Alluvium derived from limestone, dolomite, quartzite and granite	Pinus ponderosa var. scopulorum/Salix/Carex nebrascensis, F028AY128NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Lehmandow-----	25	2-8	7382-9022	16-20		Stream terrace	Alluvium derived from quartzite, limestone, and granite over till derived from quartzite, limestone and granite	WET MEADOW, R028AY072NV
Brokit-----	15	4-15	7087-8825	18-28		Ground moraine	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex, F028AY056NV
Devilsgait-----	7	0-2	None assigned	None assigned		Flood plain		Populus angustifolia/Salix- Betula occidentalis/Carex, F028AY079NV
Steptoe-----	5	4-15	None assigned	None assigned		Stream terrace	Alluvium derived from limestone, dolomite and quartzite	STREAM TYPE B, R028BY103NV
Ripcon-----	3	2-15	None assigned	None assigned		Drainageway	Alluvium derived from limestone, dolomite, quartzite, and granite	Populus angustifolia/Salix- Betula occidentalis/Carex, F028AY079NV
5430: Brokit-----	85	8-15	7087-8825	18-28	Mountains	Ground moraine	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex, F028AY056NV
Brokit-----	5	4-8	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex, F028AY056NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
	Pct	Pct	Ft	In				
Lehmandow-----	5	4-8	None assigned	None assigned		Stream terrace	Alluvium derived from quartzite, limestone, and granite over till derived from quartzite, limestone and granite	WET MEADOW, R028AY072NV
Glideski-----	5	8-15	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite, granite, and limestone	LOAMY 12-14 P.Z., R028AY092NV
5432: Glideski-----	35	4-15	6824-9186	16-20	Mountains	Stream terrace	Alluvium and outwash derived from quartzite, granite, and limestone	LOAMY 12-14 P.Z., R028AY092NV
Brokit-----	30	4-15	6824-9186	18-28		Stream terrace	Alluvium and outwash derived from quartzite and minor amounts of granite, limestone	Populus tremuloides-Abies concolor/Rosa woodsii/Poa-Carex, F028AY056NV
Lemcave-----	20	15-50	6824-9186	18-28		Lower elevation moraine	Till and outwash derived dominantly from quartzite and small amounts of granite	Abies concolor- Pseudotsuga menziesii/Mahonia repens/Poa, F028AY080NV
Lehmandow-----	5	0-4	None assigned	None assigned		Stream terrace	Alluvium derived from quartzite, limestone, and granite over till derived from quartzite, limestone and granite	WET MEADOW, R028AY072NV
Cropper family----	3	15-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from andesite, quartzite, conglomerate and rhyolite	MAHOGANY SAVANNA, R028AY059NV
Goodski-----	2	4-15	None assigned	None assigned		Mountain	Colluvium and residuum weathered from granite	SHALLOW LOAM 14+ P.Z., R028AY065NV

TABLE 8.-- LANDSCAPE, PARENT MATERIAL, AND ECOLOGICAL SITE - CONTINUED

Map unit symbol and soil name	Percent of map unit	Slope	Elevation	MAP	Landscape	Landform	Parent material	Ecological site name and number
Ripcon-----	Pct 1	Pct 2-15	Ft None assigned	In None assigned		Drainageway	Alluvium derived from limestone, dolomite, quartzite, and granite	Populus angustifolia/Salix- Betula occidentalis/Carex, F028AY079NV
5434: Lehmandow-----	90	2-8	7382-9022	16-20	Mountains	Stream terrace	Alluvium derived from quartzite, limestone, and granite over till derived from quartzite, limestone and granite	WET MEADOW, R028AY072NV
Glideski-----	6	4-15	None assigned	None assigned		Stream terrace	Alluvium and outwash derived from quartzite, granite, and limestone	LOAMY 12-14 P.Z., R028AY092NV
Closkey-----	3	4-30	None assigned	None assigned		Fan remnant	Colluvium and residuum derived from granite	GRAVELLY LOAM 12-14 P.Z., R028AY066NV
Garnel-----	1	15-30	None assigned	None assigned		Mountain	Colluvium and residuum derived from granite	Pinus monophylla/Artemisia tridentata ssp. vaseyana/Pseudoroegneria spicata ssp. spicata-Poa fendleriana, F028AY076NV
5440: Wheelerpek-----	9	8-50	None assigned	None assigned		Mountain	Colluvium and residuum derived from quartzite	ALPINE RIDGE, R028AY069NV

TABLE 9.--FORESTLAND PRODUCTIVITY

Map symbol and soil name	Potential productivity		
	Common trees	Site index	Volume of wood fiber cu ft/ac
1650: Cedarcabin-----	singleleaf pinyon---	45	4
	Utah juniper-----	45	4
1652: Cedarcabin-----	singleleaf pinyon---	45	4
	Utah juniper-----	45	4
2101: Logring-----	singleleaf pinyon---	45	4
	Utah juniper-----	45	4
2111: Garnel-----	singleleaf pinyon---	75	9
	Utah juniper-----	75	9
2430: Bellenmine-----	singleleaf pinyon---	45	4
	Utah juniper-----	45	4
3900: Osditch-----	Douglas fir-----	40	5
	white fir-----	42	5
4140: Lodar-----	singleleaf pinyon---	45	4
	Utah juniper-----	45	4
Monarch-----	singleleaf pinyon---	75	9
	Utah juniper-----	75	9
4200: Muiral-----	Douglas fir-----	40	5
	white fir-----	42	5
5100: Logring-----	singleleaf pinyon---	45	4
	Utah juniper-----	45	4
5110: Garnel-----	singleleaf pinyon---	20	2
Garnel, very steep----	singleleaf pinyon---	75	9
	Utah juniper-----	75	9
5240: Bakerpeak-----	Douglas fir-----	40	5
	white fir-----	42	5
5250: Bricone-----	Great Basin bristlecone pine---	---	---
	limber pine-----	---	---
Piar-----	Great Basin bristlecone pine---	---	---
	limber pine-----	---	---
Linpeak-----	Engelmann's spruce--	53	43
5251: Bricone-----	Great Basin bristlecone pine---	---	---
	limber pine-----	---	---
Piar-----	Engelmann's spruce--	30	25

TABLE 9.--FORESTLAND PRODUCTIVITY

Map symbol and soil name	Potential productivity		
	Common trees	Site index	Volume of wood fiber cu ft/ac
5252: Bricone-----	Great Basin bristlecone pine--- limber pine-----	--- ---	--- ---
5253: Bricone-----	Great Basin bristlecone pine--- limber pine-----	--- ---	--- ---
5261: Berrycreek-----	Engelmann's spruce-- quaking aspen-----	65 45	57 20
5270: Bakerpeak-----	Douglas fir----- white fir-----	40 42	5 5
5290: Keyole-----	Engelmann's spruce--	30	25
Osditch-----	Douglas fir----- white fir-----	40 42	5 5
5291: Keyole-----	Engelmann's spruce--	30	25
5292: Keyole-----	Engelmann's spruce--	30	25
Osditch-----	Douglas fir----- white fir-----	40 42	5 5
5310: Jumble-----	Engelmann's spruce--	30	25
Lemcave-----	Douglas fir----- white fir-----	40 42	5 5
5311: Jumble-----	Engelmann's spruce--	30	25
Lemcave-----	Douglas fir----- white fir-----	40 42	5 5
5340: Linpeak-----	Engelmann's spruce--	53	43
Piar-----	Engelmann's spruce--	30	25
Bricone-----	Great Basin bristlecone pine--- limber pine-----	--- ---	--- ---
5350: Snacreek-----	Engelmann's spruce-- quaking aspen-----	65 45	57 20
5380: Ceebee-----	Engelmann's spruce--	53	43
Strawbcrek-----	Douglas fir----- white fir-----	40 42	5 5
5381: Ceebee-----	Engelmann's spruce--	53	43
Pirapeak-----	Engelmann's spruce--	30	25

TABLE 9.--FORESTLAND PRODUCTIVITY

Map symbol and soil name	Potential productivity		
	Common trees	Site index	Volume of wood fiber
			cu ft/ac
5410: Timmercrek-----	Engelmann's spruce--	65	57
	quaking aspen-----	45	20
5425: Ripcon-----	narrowleaf	86	94
	cottonwood-----		
5428: Rippo-----	ponderosa pine-----	75	62
Brokit-----	quaking aspen-----	70	41
5430: Brokit-----	quaking aspen-----	70	41
5432: Brokit-----	quaking aspen-----	70	41
Lemcave-----	Douglas fir-----	40	5
	white fir-----	42	5

TABLE 10.--FORESTLAND SITE PREPARATION

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1650: Cedarcabin-----	25	Poorly suited Slope Rock fragments	0.50 0.50	Poorly suited Slope Rock fragments Restrictive layer	0.50 0.50 0.50
1652: Cedarcabin-----	25	Poorly suited Slope Rock fragments	0.50 0.50	Poorly suited Slope Rock fragments Restrictive layer	0.50 0.50 0.50
2101: Logring-----	25	Unsuited Slope Restrictive layer Rock fragments	1.00 1.00 0.50	Unsuited Restrictive layer Slope	1.00 1.00
2111: Garnel-----	70	Unsuited Slope	1.00	Unsuited Slope Restrictive layer	1.00 0.50
2430: Bellenmine-----	70	Poorly suited Rock fragments Slope	0.50 0.50	Unsuited Restrictive layer Rock fragments Slope	1.00 0.50 0.50
3900: Osditch-----	85	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope	1.00
4140: Lodar-----	35	Poorly suited Slope Rock fragments	0.50 0.50	Unsuited Restrictive layer Slope	1.00 0.50
Monarch-----	30	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Restrictive layer	1.00 1.00
4200: Muiral-----	15	Unsuited Slope	1.00	Unsuited Slope	1.00
5100: Logring-----	45	Unsuited Slope Restrictive layer Rock fragments	1.00 1.00 0.50	Unsuited Restrictive layer Slope	1.00 1.00
5110: Garnel-----	45	Poorly suited Slope	0.50	Poorly suited Slope Restrictive layer	0.50 0.50
Garnel, very steep--	30	Unsuited Slope	1.00	Unsuited Slope Restrictive layer	1.00 0.50

TABLE 10.--FORESTLAND SITE PREPARATION

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5240: Bakerpeak-----	15	Unsuited Slope	1.00	Unsuited Slope	1.00
5250: Bricone-----	55	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Restrictive layer Rock fragments	1.00 1.00 0.50
Piar-----	15	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope	1.00
Linpeak-----	15	Poorly suited Slope	0.50	Poorly suited Slope	0.50
5251: Bricone-----	50	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Restrictive layer Rock fragments	1.00 1.00 0.50
Piar-----	20	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope	1.00
5252: Bricone-----	60	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Restrictive layer Rock fragments	1.00 1.00 0.50
5253: Bricone-----	30	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Restrictive layer Rock fragments	1.00 1.00 0.50
5261: Berrycreek-----	15	Poorly suited Slope Rock fragments	0.50 0.50	Poorly suited Slope	0.50
5270: Bakerpeak-----	40	Unsuited Slope	1.00	Unsuited Slope	1.00
5290: Keyole-----	40	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
Osditch-----	25	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope	1.00
5291: Keyole-----	50	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50

TABLE 10.--FORESTLAND SITE PREPARATION

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5292: Keyole-----	50	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
Osditch-----	35	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope	1.00
5310: Jumble-----	55	Poorly suited Rock fragments Slope	0.50 0.50	Unsuited Rock fragments Slope	1.00 0.50
Lemcave-----	30	Unsuited Rock fragments Slope	1.00 0.50	Poorly suited Rock fragments Slope	0.50 0.50
5311: Jumble-----	40	Poorly suited Rock fragments Slope	0.50 0.50	Unsuited Rock fragments Slope	1.00 0.50
Lemcave-----	30	Unsuited Rock fragments Slope	1.00 0.50	Poorly suited Rock fragments Slope	0.50 0.50
5340: Linpeak-----	50	Poorly suited Slope	0.50	Poorly suited Slope	0.50
Piar-----	20	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope	1.00
Bricone-----	15	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Restrictive layer Rock fragments	1.00 1.00 0.50
5350: Snacreek-----	15	Poorly suited Slope	0.50	Poorly suited Slope	0.50
5380: Ceebee-----	50	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
Strawbcrek-----	40	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
5381: Ceebee-----	50	Unsuited Slope Rock fragments	1.00 0.50	Unsuited Slope Rock fragments	1.00 0.50
Pirapeak-----	40	Unsuited Rock fragments Slope	1.00 1.00	Unsuited Rock fragments Slope	1.00 1.00

TABLE 10.--FORESTLAND SITE PREPARATION

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5410: Timmercrek-----	85	Poorly suited Slope Rock fragments	0.50 0.50	Poorly suited Slope Rock fragments	0.50 0.50
5425: Ripcon-----	40	Well suited		Well suited	
5428: Rippo-----	45	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Brokit-----	15	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
5430: Brokit-----	85	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
5432: Brokit-----	30	Poorly suited Rock fragments	0.50	Poorly suited Rock fragments	0.50
Lemcave-----	20	Unsuited Rock fragments Slope	1.00 0.50	Poorly suited Slope Rock fragments	0.50 0.50

TABLE 11.--HAUL ROADS AND SOIL RUTTING ON FORESTLAND

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1650: Cedarcabin-----	25	Moderate Slope Restrictive layer Stoniness	0.50 0.50 0.50	Moderate Low strength	0.50
1652: Cedarcabin-----	25	Moderate Restrictive layer Slope Stoniness	0.50 0.50 0.50	Moderate Low strength	0.50
2101: Logring-----	25	Severe Slope	1.00	Moderate Low strength	0.50
2111: Garnel-----	70	Severe Slope	1.00	Moderate Low strength	0.50
2430: Bellenmine-----	70	Severe Restrictive layer Stoniness Slope	1.00 0.50 0.50	Slight Strength	0.10
3900: Osditch-----	85	Severe Slope	1.00	Slight Strength	0.10
4140: Lodar-----	35	Severe Slope	1.00	Moderate Low strength	0.50
Monarch-----	30	Severe Slope	1.00	Moderate Low strength	0.50
4200: Muiral-----	15	Severe Slope	1.00	Moderate Low strength	0.50
5100: Logring-----	45	Severe Slope	1.00	Moderate Low strength	0.50
5110: Garnel-----	45	Moderate Restrictive layer Slope Sandiness	0.50 0.50 0.50	Moderate Low strength	0.50
Garnel, very steep--	30	Severe Slope	1.00	Moderate Low strength	0.50
5240: Bakerpeak-----	15	Severe Slope	1.00	Moderate Low strength	0.50

TABLE 11.--HAUL ROADS, LOG LANDINGS, AND SOIL RUTTING ON FORESTLAND

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5250: Bricone-----	55	Severe Slope Stoniness	1.00 0.50	Moderate Low strength	0.50
Piar-----	15	Severe Slope	1.00	Slight Strength	0.10
Linpeak-----	15	Severe Slope	1.00	Slight Strength	0.10
5251: Bricone-----	50	Severe Slope Stoniness	1.00 0.50	Moderate Low strength	0.50
Piar-----	20	Severe Slope	1.00	Slight Strength	0.10
5252: Bricone-----	60	Severe Slope Stoniness	1.00 0.50	Moderate Low strength	0.50
5253: Bricone-----	30	Severe Slope Stoniness	1.00 0.50	Moderate Low strength	0.50
5261: Berrycreek-----	15	Severe Slope	1.00	Moderate Low strength	0.50
5270: Bakerpeak-----	40	Severe Slope	1.00	Moderate Low strength	0.50
5290: Keyole-----	40	Severe Slope Stoniness	1.00 0.50	Slight Strength	0.10
Osditch-----	25	Severe Slope	1.00	Slight Strength	0.10
5291: Keyole-----	50	Severe Slope Stoniness	1.00 0.50	Slight Strength	0.10
5292: Keyole-----	50	Severe Slope Stoniness	1.00 0.50	Slight Strength	0.10
Osditch-----	35	Severe Slope	1.00	Slight Strength	0.10

TABLE 11.--HAUL ROADS, LOG LANDINGS, AND SOIL RUTTING ON FORESTLAND

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5310: Jumble-----	55	Severe Stoniness Slope	1.00 0.50	Slight Strength	0.10
Lemcave-----	30	Moderate Stoniness Slope Sandiness	0.50 0.50 0.50	Slight Strength	0.10
5311: Jumble-----	40	Severe Stoniness Slope	1.00 0.50	Slight Strength	0.10
Lemcave-----	30	Moderate Stoniness Slope Sandiness	0.50 0.50 0.50	Slight Strength	0.10
5340: Linpeak-----	50	Severe Slope	1.00	Slight Strength	0.10
Piar-----	20	Severe Slope	1.00	Slight Strength	0.10
Bricone-----	15	Severe Slope Stoniness	1.00 0.50	Moderate Low strength	0.50
5350: Snacreek-----	15	Moderate Slope Sandiness	0.50 0.50	Moderate Low strength	0.50
5380: Ceebee-----	50	Severe Slope Stoniness	1.00 0.50	Moderate Low strength	0.50
Strawbcrek-----	40	Severe Slope Stoniness	1.00 0.50	Moderate Low strength	0.50
5381: Ceebee-----	50	Severe Slope Stoniness	1.00 0.50	Moderate Low strength	0.50
Pirapeak-----	40	Severe Stoniness Slope	1.00 1.00	Slight Strength	0.10
5410: Timmercrek-----	85	Severe Slope Stoniness	1.00 0.50	Moderate Low strength	0.50
5425: Ripcon-----	40	Severe Flooding	1.00	Moderate Low strength	0.50

TABLE 11.--HAUL ROADS, LOG LANDINGS, AND SOIL RUTTING ON FORESTLAND

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5428: Rippo-----	45	Severe Flooding Stoniness	1.00 1.00	Moderate Low strength	0.50
Brokit-----	15	Severe Flooding Stoniness	1.00 1.00	Slight Strength	0.10
5430: Brokit-----	85	Severe Flooding Stoniness	1.00 1.00	Slight Strength	0.10
5432: Brokit-----	30	Severe Flooding Stoniness	1.00 1.00	Slight Strength	0.10
Lemcave-----	20	Severe Slope Stoniness	1.00 0.50	Slight Strength	0.10

TABLE 12.--LAND MANAGEMENT - HAZARD OF EROSION AND SUITABILITY FOR ROADS

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1650: Cedarcabin-----	25	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
1652: Cedarcabin-----	25	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
2101: Logring-----	25	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
2111: Garnel-----	70	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
2430: Bellenmine-----	70	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
3900: Osditch-----	85	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
4140: Lodar-----	35	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Monarch-----	30	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Low strength Rock fragments	1.00 0.50 0.50
4200: Muiral-----	15	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
5100: Logring-----	45	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
5110: Garnel-----	45	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
Garnel, very steep--	30	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
5240: Bakerpeak-----	15	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00

TABLE 12.--LAND MANAGEMENT - HAZARD OF EROSION AND SUITABILITY FOR ROADS

Map symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5250: Bricone-----	55	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness Rock fragments	1.00 0.50 0.50
Piar-----	15	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Linpeak-----	15	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
5251: Bricone-----	50	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness Rock fragments	1.00 0.50 0.50
Piar-----	20	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
5252: Bricone-----	60	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness Rock fragments	1.00 0.50 0.50
5253: Bricone-----	30	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness Rock fragments	1.00 0.50 0.50
5261: Berrycreek-----	15	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
5270: Bakerpeak-----	40	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
5290: Keyole-----	40	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Osditch-----	25	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
5291: Keyole-----	50	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
5292: Keyole-----	50	Severe Slope/erodibility	0.75	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
Osditch-----	35	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00

TABLE 12.--LAND MANAGEMENT - HAZARD OF EROSION AND SUITABILITY FOR ROADS

Map symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5310: Jumble-----	55	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Lemcave-----	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Rock fragments Slope Sandiness	1.00 1.00 0.50
5311: Jumble-----	40	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Lemcave-----	30	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Rock fragments Slope Sandiness	1.00 1.00 0.50
5340: Linpeak-----	50	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Piar-----	20	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope	1.00
Bricone-----	15	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness Rock fragments	1.00 0.50 0.50
5350: Snacreek-----	15	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Sandiness	1.00 0.50
5380: Ceebee-----	50	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Strawbcrek-----	40	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 0.50 0.50
5381: Ceebee-----	50	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
Pirapeak-----	40	Very severe Slope/erodibility	0.95	Severe Slope/erodibility	0.95	Poorly suited Rock fragments Slope	1.00 1.00
5410: Timmercrek-----	85	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments	1.00 0.50
5425: Ripcon-----	40	Slight		Moderate Slope/erodibility	0.50	Poorly suited Flooding	1.00

TABLE 12.--LAND MANAGEMENT - HAZARD OF EROSION AND SUITABILITY FOR ROADS

Map symbol and soil name	Pct. of map unit	Hazard of erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5428: Rippo-----	45	Slight		Moderate Slope/erodibility	0.50	Poorly suited Flooding Slope Rock fragments	1.00 0.50 0.50
Brokit-----	15	Slight		Moderate Slope/erodibility	0.50	Poorly suited Flooding Slope Rock fragments	1.00 0.50 0.50
5430: Brokit-----	85	Slight		Moderate Slope/erodibility	0.50	Poorly suited Flooding Slope Rock fragments	1.00 0.50 0.50
5432: Brokit-----	30	Slight		Slight		Poorly suited Flooding Slope Rock fragments	1.00 0.50 0.50
Lemcave-----	20	Moderate Slope/erodibility	0.50	Severe Slope/erodibility	0.95	Poorly suited Slope Rock fragments Sandiness	1.00 1.00 0.50

TABLE 13.--LAND MANAGEMENT - SITE RESTORATION

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1650: Cedarcabin-----	25	Moderate Texture/slope/sur face depth/rock fragments	0.50	High Carbonate content	1.00
				Soil reaction	0.50
				Available water	0.50
1652: Cedarcabin-----	25	Low Texture/surface depth/rock fragments	0.10	High Carbonate content	1.00
				Soil reaction	0.50
				Available water	0.50
2101: Logring-----	25	High Texture/slope/sur face depth/rock fragments	1.00	High Soil reaction	1.00
				Carbonate content	0.50
				Available water	0.50
2111: Garnel-----	70	High Texture/slope/roc k fragments	1.00	Moderate Available water	0.50
2430: Bellenmine-----	70	Low Texture/rock fragments	0.10	Moderate Available water	0.50
3900: Osditch-----	85	High Texture/slope/sur face depth/rock fragments	1.00	Moderate Available water	0.50
4140: Lodar-----	35	High Texture/slope/sur face depth/rock fragments	1.00	High Carbonate content	1.00
				Available water	1.00
Monarch-----	30	Moderate Texture/slope/roc k fragments	0.50	Moderate Carbonate content	0.50
				Soil reaction	0.50
				Available water	0.50
4200: Muiral-----	15	High Texture/slope/sur face depth/rock fragments	1.00	Low	

TABLE 13.--LAND MANAGEMENT - SITE RESTORATION

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5100: Logring-----	45	High Texture/slope/sur face depth/rock fragments	1.00	High Soil reaction	1.00
				Carbonate content	0.50
				Available water	0.50
5110: Garnel-----	45	High Texture/rock fragments	1.00	Moderate Available water	0.50
Garnel, very steep--	30	High Texture/slope/roc k fragments	1.00	Moderate Available water	0.50
5240: Bakerpeak-----	15	High Texture/slope/sur face depth/rock fragments	1.00	Moderate Carbonate content	0.50
				Available water	0.50
5250: Bricone-----	55	High Texture/slope/sur face depth/rock fragments	1.00	High Available water	1.00
				Soil reaction	0.50
Piar-----	15	High Texture/slope/sur face depth/rock fragments	1.00	High Available water	1.00
				Carbonate content	0.50
Linpeak-----	15	High Texture/slope/sur face depth/rock fragments	1.00	Low	
5251: Bricone-----	50	High Texture/slope/sur face depth/rock fragments	1.00	High Available water	1.00
				Soil reaction	0.50
Piar-----	20	High Texture/slope/sur face depth/rock fragments	1.00	Moderate Carbonate content	0.50
				Available water	0.50
5252: Bricone-----	60	High Texture/slope/sur face depth/rock fragments	1.00	Moderate Available water	0.50
				Soil reaction	0.50
5253: Bricone-----	30	High Texture/slope/sur face depth/rock fragments	1.00	High Available water	1.00
				Soil reaction	0.50

TABLE 13.--LAND MANAGEMENT - SITE RESTORATION

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5261: Berrycreek-----	15	Low Texture/rock fragments	0.10	Low	
5270: Bakerpeak-----	40	High Texture/slope/sur face depth/rock fragments	1.00	Moderate Carbonate content	0.50
				Available water	0.50
5290: Keyole-----	40	High Texture/slope/sur face depth/rock fragments	1.00	Moderate Available water	0.50
Osditch-----	25	High Texture/slope/sur face depth/rock fragments	1.00	Moderate Available water	0.50
5291: Keyole-----	50	High Texture/slope/sur face depth/rock fragments	1.00	Moderate Available water	0.50
5292: Keyole-----	50	High Texture/slope/sur face depth/rock fragments	1.00	Moderate Available water	0.50
Osditch-----	35	High Texture/slope/sur face depth/rock fragments	1.00	Moderate Available water	0.50
5310: Jumble-----	55	Low		Moderate Available water	0.50
Lemcave-----	30	Moderate Texture/slope/roc k fragments	0.50	Moderate Available water	0.50
5311: Jumble-----	40	Low		Moderate Available water	0.50
Lemcave-----	30	High Texture/slope/roc k fragments	1.00	High Available water	1.00
5340: Linpeak-----	50	High Texture/slope/sur face depth/rock fragments	1.00	Low	
Piar-----	20	High Texture/slope/sur face depth/rock fragments	1.00	Moderate Carbonate content	0.50
				Available water	0.50

TABLE 13.--LAND MANAGEMENT - SITE RESTORATION

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire		Potential for seedling mortality	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Bricone-----	15	High Texture/slope/sur face depth/rock fragments	1.00	High Available water	1.00
				Soil reaction	0.50
5350: Snacreek-----	15	Moderate Texture/rock fragments	0.50	Moderate Available water	0.50
5380: Ceebee-----	50	Moderate Texture/slope/roc k fragments	0.50	Moderate Available water	0.50
Strawbcreek-----	40	High Texture/slope/sur face depth	1.00	Moderate Available water	0.50
5381: Ceebee-----	50	Moderate Texture/slope/roc k fragments	0.50	Moderate Available water	0.50
Pirapeak-----	40	High Texture/slope/roc k fragments	1.00	High Available water	1.00
5410: Timmercreek-----	85	Low Texture/rock fragments	0.10	Low	
5425: Ripcon-----	40	Low Texture/rock fragments	0.10	High Available water	1.00
5428: Rippo-----	45	Low Texture/rock fragments	0.10	Low	
Brokit-----	15	Low Texture/rock fragments	0.10	High Available water	1.00
5430: Brokit-----	85	Low Texture/rock fragments	0.10	High Available water	1.00
5432: Brokit-----	30	Low Texture/rock fragments	0.10	High Available water	1.00
Lemcave-----	20	Moderate Texture/slope/roc k fragments	0.50	Moderate Available water	0.50

TABLE 14.--CAMP AND PICNIC AREAS

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1650: Noski-----	35	Very limited Too steep Large stones content Depth to bedrock Gravel Dusty	 1.00 1.00 1.00 0.97 0.50	Very limited Too steep Large stones content Depth to bedrock Gravel Dusty	 1.00 1.00 1.00 0.97 0.50
Cedarcabin-----	25	Very limited Too steep Large stones content Dusty Gravel	 1.00 1.00 0.50 0.36	Very limited Too steep Large stones content Dusty Gravel	 1.00 1.00 0.50 0.36
Noski-----	25	Very limited Too steep Large stones content Depth to bedrock Gravel Dusty	 1.00 1.00 1.00 0.97 0.50	Very limited Too steep Large stones content Depth to bedrock Gravel Dusty	 1.00 1.00 1.00 0.97 0.50
1652: Noski-----	35	Very limited Too steep Large stones content Depth to bedrock Gravel Dusty	 1.00 1.00 1.00 0.97 0.50	Very limited Too steep Large stones content Depth to bedrock Gravel Dusty	 1.00 1.00 1.00 0.97 0.50
Canyonfork-----	30	Very limited Flooding Gravel Too sandy Slope	 1.00 1.00 0.01 0.01	Very limited Gravel Too sandy Slope	 1.00 0.01 0.01
Cedarcabin-----	25	Very limited Too steep Large stones content Dusty Gravel	 1.00 1.00 0.50 0.36	Very limited Too steep Large stones content Dusty Gravel	 1.00 1.00 0.50 0.36
1700: Eenreed-----	40	Very limited Gravel Dusty Large stones content Slope	 1.00 0.50 0.19 0.16	Very limited Gravel Dusty Large stones content Slope	 1.00 0.50 0.19 0.16
Millan-----	30	Very limited Too steep Gravel Dusty Large stones content	 1.00 1.00 0.50 0.19	Very limited Too steep Gravel Dusty Large stones content	 1.00 1.00 0.50 0.19

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Eenreed-----	15	Very limited Too steep Gravel Dusty Large stones content	 1.00 1.00 0.50 0.19	Very limited Too steep Gravel Dusty Large stones content	 1.00 1.00 0.50 0.19
1900: Borvant-----	90	Very limited Gravel Depth to cemented pan Too steep Dusty	 1.00 1.00 1.00 0.50	Very limited Gravel Depth to cemented pan Too steep Dusty	 1.00 1.00 1.00 0.50
2000: Closkey-----	85	Very limited Gravel Too steep Too sandy	 1.00 1.00 0.74	Very limited Gravel Too steep Too sandy	 1.00 1.00 0.74
2101: Radol-----	40	Very limited Too steep Gravel Depth to bedrock Large stones content Salinity	 1.00 1.00 1.00 0.76 0.01	Very limited Too steep Gravel Depth to bedrock Large stones content Salinity	 1.00 1.00 1.00 0.76 0.01
Logring-----	25	Very limited Too steep Gravel Depth to bedrock Dusty	 1.00 1.00 1.00 0.50	Very limited Too steep Gravel Depth to bedrock Dusty	 1.00 1.00 1.00 0.50
Rock outcrop-----	20	Not rated		Not rated	
2103: Radol-----	40	Very limited Too steep Gravel Depth to bedrock Large stones content Salinity	 1.00 1.00 1.00 0.76 0.01	Very limited Too steep Gravel Depth to bedrock Large stones content Salinity	 1.00 1.00 1.00 0.76 0.01
Hyzen-----	30	Very limited Too steep Large stones content Depth to bedrock Gravel	 1.00 1.00 1.00 0.01	Very limited Large stones content Too steep Depth to bedrock Gravel	 1.00 1.00 1.00 0.01
Rock outcrop-----	20	Not rated		Not rated	
2111: Garnel-----	70	Very limited Too steep Depth to bedrock Gravel Large stones content	 1.00 1.00 1.00 0.19	Very limited Too steep Depth to bedrock Gravel Large stones content	 1.00 1.00 1.00 0.19
Rock outcrop-----	25	Not rated		Not rated	

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2430: Bellenmine-----	70	Very limited Large stones content Gravel Too steep Depth to bedrock	1.00 1.00 1.00 1.00	Very limited Large stones content Gravel Too steep Depth to bedrock	1.00 1.00 1.00 1.00
Basinpeak-----	15	Very limited Too steep Large stones content Dusty Gravel	1.00 1.00 0.50 0.47	Very limited Too steep Large stones content Dusty Gravel	1.00 1.00 0.50 0.47
2432: Majorsplace-----	40	Very limited Large stones content Too steep Depth to bedrock Gravel Dusty	1.00 1.00 1.00 0.64 0.50	Very limited Large stones content Too steep Depth to bedrock Gravel Dusty	1.00 1.00 1.00 0.64 0.50
Checkett-----	30	Very limited Too steep Large stones content Depth to bedrock Gravel Dusty	1.00 1.00 1.00 0.67 0.50	Very limited Too steep Large stones content Depth to bedrock Gravel Dusty	1.00 1.00 1.00 0.67 0.50
Grube-----	15	Very limited Too steep Large stones content	1.00 1.00 1.00	Very limited Large stones content Too steep	1.00 1.00
3344: Badena-----	60	Very limited Large stones content Too steep Dusty Gravel	1.00 1.00 0.50 0.01	Very limited Large stones content Too steep Dusty Gravel	1.00 1.00 0.50 0.01
Badena-----	25	Very limited Large stones content Too steep	1.00 1.00	Very limited Large stones content Too steep	1.00 1.00
3439: Eaglepass-----	45	Very limited Too steep Large stones content Depth to bedrock Gravel Dusty	1.00 1.00 1.00 0.88 0.50	Very limited Large stones content Too steep Depth to bedrock Gravel Dusty	1.00 1.00 1.00 0.88 0.50
Rock outcrop-----	25	Not rated		Not rated	

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Amtoft-----	15	Very limited Gravel Too steep Depth to bedrock Dusty Large stones content	1.00 1.00 1.00 0.50 0.19	Very limited Gravel Too steep Depth to bedrock Dusty Large stones content	1.00 1.00 1.00 0.50 0.19
3900: Osditch-----	85	Very limited Too steep Large stones content	1.00 1.00	Very limited Large stones content Too steep	1.00 1.00
4140: Lodar-----	35	Very limited Too steep Gravel Depth to bedrock Dusty Large stones content	1.00 1.00 1.00 0.50 0.19	Very limited Too steep Gravel Depth to bedrock Dusty Large stones content	1.00 1.00 1.00 0.50 0.19
Monarch-----	30	Very limited Too steep Depth to bedrock Large stones content Gravel	1.00 1.00 0.19 0.01	Very limited Too steep Depth to bedrock Large stones content Gravel	1.00 1.00 0.19 0.01
Highup-----	20	Very limited Too steep Gravel Large stones content Dusty	1.00 1.00 1.00 0.50	Very limited Too steep Gravel Large stones content Dusty	1.00 1.00 1.00 0.50
4200: Wardbay-----	50	Very limited Too steep Gravel	1.00 1.00	Very limited Too steep Gravel	1.00 1.00
Haunchee-----	20	Very limited Too steep Large stones content Depth to bedrock Dusty Gravel	1.00 1.00 1.00 0.50 0.01	Very limited Large stones content Too steep Depth to bedrock Dusty Gravel	1.00 1.00 1.00 0.50 0.01
Muiral-----	15	Very limited Too steep Gravel	1.00 0.92	Very limited Too steep Gravel	1.00 0.92
5100: Logring-----	45	Very limited Too steep Gravel Depth to bedrock Dusty	1.00 1.00 1.00 0.50	Very limited Too steep Gravel Depth to bedrock Dusty	1.00 1.00 1.00 0.50

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Hyzen-----	25	Very limited Too steep Large stones content Depth to bedrock Gravel	 1.00 1.00 1.00 0.01	Very limited Large stones content Too steep Depth to bedrock Gravel	 1.00 1.00 1.00 0.01
Canyoung-----	15	Very limited Too steep Gravel Dusty Large stones content	 1.00 1.00 0.50 0.19	Very limited Too steep Gravel Dusty Large stones content	 1.00 1.00 0.50 0.19
5102: Canyoung-----	40	Very limited Gravel Dusty Large stones content Slope	 1.00 0.50 0.19 0.16	Very limited Gravel Dusty Large stones content Slope	 1.00 0.50 0.19 0.16
Zarark-----	30	Very limited Gravel Slope	 1.00 0.16	Very limited Gravel Slope	 1.00 0.16
Wardbay-----	20	Very limited Too steep Gravel	 1.00 1.00	Very limited Too steep Gravel	 1.00 1.00
5110: Garnel-----	45	Very limited Depth to bedrock Too steep Gravel Large stones content	 1.00 1.00 1.00 0.19	Very limited Depth to bedrock Too steep Gravel Large stones content	 1.00 1.00 1.00 0.19
Garnel, very steep--	30	Very limited Too steep Depth to bedrock Gravel Large stones content	 1.00 1.00 1.00 0.19	Very limited Too steep Depth to bedrock Gravel Large stones content	 1.00 1.00 1.00 0.19
Rock outcrop-----	15	Not rated		Not rated	
5140: Wardbay-----	45	Very limited Gravel Too steep	 1.00 1.00	Very limited Gravel Too steep	 1.00 1.00
Canyoung-----	25	Very limited Too steep Gravel Dusty Large stones content	 1.00 1.00 0.50 0.19	Very limited Too steep Gravel Dusty Large stones content	 1.00 1.00 0.50 0.19
Rock outcrop-----	15	Not rated		Not rated	

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5160: Hyzen-----	65	Very limited Too steep Large stones content Depth to bedrock Gravel	1.00 1.00 1.00 0.01	Very limited Large stones content Too steep Depth to bedrock Gravel	1.00 1.00 1.00 0.01
Rock outcrop-----	20	Not rated		Not rated	
5210: Badhap-----	35	Very limited Too steep Gravel Large stones content	1.00 0.38 0.01	Very limited Too steep Gravel Large stones content	1.00 0.38 0.01
Badhap-----	25	Very limited Too steep Gravel	1.00 1.00	Very limited Too steep Gravel	1.00 1.00
Topeki-----	25	Very limited Large stones content Too steep Depth to bedrock Gravel	1.00 1.00 1.00 0.92	Very limited Large stones content Too steep Depth to bedrock Gravel	1.00 1.00 1.00 0.92
5220: Basinpeak-----	60	Very limited Large stones content Too steep Dusty Gravel	1.00 1.00 0.50 0.47	Very limited Large stones content Too steep Dusty Gravel	1.00 1.00 0.50 0.47
Badhap-----	25	Very limited Too steep Gravel	1.00 1.00	Very limited Too steep Gravel	1.00 1.00
5240: Wardbay-----	35	Very limited Gravel Too steep	1.00 1.00	Very limited Gravel Too steep	1.00 1.00
Haunchee-----	35	Very limited Too steep Large stones content Depth to bedrock Dusty Gravel	1.00 1.00 1.00 0.50 0.01	Very limited Large stones content Too steep Depth to bedrock Dusty Gravel	1.00 1.00 1.00 0.50 0.01
Bakerpeak-----	15	Very limited Too steep Gravel Large stones content	1.00 1.00 0.23	Very limited Too steep Gravel Large stones content	1.00 1.00 0.23

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5241: Haunchee-----	40	Very limited Too steep Large stones content Depth to bedrock Dusty Gravel	1.00 1.00 1.00 0.50 0.01	Very limited Large stones content Too steep Depth to bedrock Dusty Gravel	1.00 1.00 1.00 0.50 0.01
Canyoung-----	30	Very limited Too steep Gravel Dusty Large stones content	1.00 1.00 0.50 0.19	Very limited Too steep Gravel Dusty Large stones content	1.00 1.00 0.50 0.19
Rock outcrop-----	20	Not rated		Not rated	
5250: Bricone-----	55	Very limited Too steep Gravel Large stones content Depth to bedrock	1.00 1.00 1.00 1.00	Very limited Too steep Gravel Large stones content Depth to bedrock	1.00 1.00 1.00 1.00
Piar-----	15	Very limited Too steep Gravel Large stones content	1.00 1.00 0.19	Very limited Too steep Gravel Large stones content	1.00 1.00 0.19
Linpeak-----	15	Very limited Too steep Gravel	1.00 1.00	Very limited Too steep Gravel	1.00 1.00
5251: Bricone-----	50	Very limited Too steep Gravel Large stones content Depth to bedrock	1.00 1.00 1.00 1.00	Very limited Too steep Gravel Large stones content Depth to bedrock	1.00 1.00 1.00 1.00
Piar-----	20	Very limited Too steep Gravel Large stones content	1.00 1.00 0.19	Very limited Too steep Gravel Large stones content	1.00 1.00 0.19
Rock outcrop-----	15	Not rated		Not rated	
5252: Bricone-----	60	Very limited Too steep Gravel Large stones content Depth to bedrock	1.00 1.00 1.00 1.00	Very limited Too steep Gravel Large stones content Depth to bedrock	1.00 1.00 1.00 1.00
Rock outcrop-----	30	Not rated		Not rated	

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5253: Windwash-----	40	Very limited Large stones content Gravel Too steep Too sandy	 1.00 1.00 1.00 0.67	Very limited Large stones content Gravel Too steep Too sandy	 1.00 1.00 1.00 0.67
Bricone-----	30	Very limited Too steep Gravel Large stones content Depth to bedrock	 1.00 1.00 1.00 1.00	Very limited Too steep Gravel Large stones content Depth to bedrock	 1.00 1.00 1.00 1.00
Rock outcrop-----	15	Not rated		Not rated	
5255: Wayhigh-----	90	Very limited Gravel Too sandy Slope	 1.00 0.01 0.01	Very limited Gravel Too sandy Slope	 1.00 0.01 0.01
5261: Jonlake-----	45	Very limited Too steep Gravel Depth to bedrock Large stones content	 1.00 1.00 1.00 0.76	Very limited Too steep Gravel Depth to bedrock Large stones content	 1.00 1.00 1.00 0.76
Badhap-----	25	Very limited Too steep Gravel Large stones content	 1.00 0.38 0.01	Very limited Too steep Gravel Large stones content	 1.00 0.38 0.01
Berrycreek-----	15	Very limited Too steep Gravel	 1.00 1.00	Very limited Too steep Gravel	 1.00 1.00
5270: Bakerpeak-----	40	Very limited Too steep Gravel Large stones content	 1.00 1.00 0.23	Very limited Too steep Gravel Large stones content	 1.00 1.00 0.23
Canyoung-----	35	Very limited Too steep Gravel Dusty Large stones content	 1.00 1.00 0.50 0.19	Very limited Too steep Gravel Dusty Large stones content	 1.00 1.00 0.50 0.19
Rock outcrop-----	15	Not rated		Not rated	
5290: Keyole-----	40	Very limited Too steep Large stones content	 1.00 1.00	Very limited Large stones content Too steep	 1.00 1.00
Osditch-----	25	Very limited Too steep Large stones content	 1.00 1.00	Very limited Large stones content Too steep	 1.00 1.00

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Topeki-----	20	Very limited Too steep	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	0.92	Gravel	0.92
5291: Keyole-----	50	Very limited Too steep	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
Rubble land-----	35	Not rated		Not rated	
5292: Keyole-----	50	Very limited Too steep	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
Osditch-----	35	Very limited Too steep	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
5310: Jumble-----	55	Very limited Large stones content	1.00	Very limited Large stones content	1.00
		Too steep	1.00	Too steep	1.00
Lemcave-----	30	Very limited Large stones content	1.00	Very limited Large stones content	1.00
		Too steep	1.00	Too steep	1.00
		Gravel	0.76	Gravel	0.76
5311: Jumble-----	40	Very limited Large stones content	1.00	Very limited Large stones content	1.00
		Too steep	1.00	Too steep	1.00
Lemcave-----	30	Very limited Large stones content	1.00	Very limited Large stones content	1.00
		Too steep	1.00	Too steep	1.00
		Gravel	0.76	Gravel	0.76
Gaia-----	15	Very limited Too steep	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
		Gravel	0.95	Gravel	0.95
		Dusty	0.50	Dusty	0.50
5320: Wardbay-----	40	Very limited Too steep	1.00	Very limited Too steep	1.00
		Gravel	1.00	Gravel	1.00

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Wardbay, convex slopes-----	30	Very limited Too steep Gravel	 1.00 1.00	Very limited Too steep Gravel	 1.00 1.00
Basinpeak-----	20	Very limited Too steep Large stones content Dusty Gravel	 1.00 1.00 0.50 0.47	Very limited Too steep Large stones content Dusty Gravel	 1.00 1.00 0.50 0.47
5330: Rubble land-----	35	Not rated		Not rated	
Wheelerpek-----	30	Very limited Too steep Large stones content Depth to bedrock Gravel	 1.00 1.00 1.00 0.10	Very limited Large stones content Too steep Depth to bedrock Gravel	 1.00 1.00 1.00 0.10
Cobblywheel-----	25	Not rated Not rated; Surface Fragments > 75mm Not rated; Surface clay percent or taxonomic class Not rated; % surface sand or clay Too steep	 1.00	Not rated Not rated; Surface Fragments > 75mm Not rated; Surface clay percent or taxonomic class Not rated; % surface sand or clay Too steep	 1.00
5340: Linpeak-----	50	Very limited Too steep Gravel	 1.00 1.00	Very limited Too steep Gravel	 1.00 1.00
Piar-----	20	Very limited Too steep Gravel Large stones content	 1.00 1.00 0.19	Very limited Too steep Gravel Large stones content	 1.00 1.00 0.19
Bricone-----	15	Very limited Too steep Gravel Large stones content Depth to bedrock	 1.00 1.00 1.00 1.00	Very limited Too steep Gravel Large stones content Depth to bedrock	 1.00 1.00 1.00 1.00
5350: Goodski-----	35	Very limited Gravel Too steep Large stones content	 1.00 1.00 0.76	Very limited Gravel Too steep Large stones content	 1.00 1.00 0.76
Kious-----	35	Very limited Too steep Large stones content Gravel Depth to bedrock Too sandy	 1.00 1.00 1.00 1.00 0.82	Very limited Large stones content Too steep Gravel Depth to bedrock Too sandy	 1.00 1.00 1.00 1.00 0.82

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Snacreek-----	15	Not rated Not rated; Surface Fragments > 75mm Too steep	1.00	Not rated Not rated; Surface Fragments > 75mm Too steep	1.00
5380: Ceebee-----	50	Very limited Too steep	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
		Gravel	0.16	Gravel	0.16
Strawbcrek-----	40	Very limited Too steep	1.00	Very limited Too steep	1.00
		Large stones content	1.00	Large stones content	1.00
		Gravel	0.23	Gravel	0.23
5381: Ceebee-----	50	Very limited Too steep	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
		Gravel	0.16	Gravel	0.16
Pirapeak-----	40	Very limited Too steep	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
5410: Timmercrek-----	85	Very limited Too steep	1.00	Very limited Too steep	1.00
		Large stones content	1.00	Large stones content	1.00
		Gravel	1.00	Gravel	1.00
5420: Topeki-----	35	Very limited Too steep	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Gravel	0.92	Gravel	0.92
Badhap-----	35	Very limited Too steep	1.00	Very limited Too steep	1.00
		Gravel	0.38	Gravel	0.38
		Large stones content	0.01	Large stones content	0.01
Jonlake-----	15	Very limited Gravel	1.00	Very limited Gravel	1.00
		Too steep	1.00	Too steep	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.76	Large stones content	0.76
5425: Ripcon-----	40	Very limited Flooding Gravel	1.00 0.92	Somewhat limited Gravel	0.92

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Bigwash-----	30	Very limited Flooding	1.00	Not limited	
Glideski-----	15	Very limited Large stones content	1.00	Very limited Large stones content	1.00
		Gravel	0.71	Gravel	0.71
		Slope	0.04	Slope	0.04
5428: Rippo-----	45	Very limited Flooding	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Slope	0.01
		Slope	0.01		
Lehmandow-----	25	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	1.00
		Slow water movement	1.00		
Brokit-----	15	Very limited Flooding	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Slope	0.16
		Slope	0.16		
5430: Brokit-----	85	Very limited Flooding	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Slope	0.63
		Slope	0.63		
5432: Glideski-----	35	Very limited Large stones content	1.00	Very limited Large stones content	1.00
		Gravel	0.71	Gravel	0.71
		Slope	0.04	Slope	0.04
Brokit-----	30	Very limited Flooding	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Slope	0.04
		Slope	0.04		
Lemcave-----	20	Very limited Too steep	1.00	Very limited Large stones content	1.00
		Large stones content	1.00	Too steep	1.00
		Gravel	0.76	Gravel	0.76

TABLE 14.--CAMP AND PICNIC AREAS

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5434: Lehmandow-----	90	Very limited Depth to saturated zone Flooding Slow water movement	1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement	1.00 1.00
5440: Glaciers-----	85	Not rated		Not rated	

TABLE 15.--TRAIL MANAGEMENT

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1650: Noski-----	35	Very limited Slope Large stones content Dusty	 1.00 1.00 0.50	Very limited Slope Large stones content Dusty	 1.00 1.00 0.50
Cedarcabin-----	25	Very limited Large stones content Slope Dusty	 1.00 1.00 0.50	Very limited Large stones content Dusty Slope	 1.00 0.50 0.22
Noski-----	25	Very limited Large stones content Dusty Slope	 1.00 0.50 0.18	Very limited Large stones content Dusty	 1.00 0.50
1652: Noski-----	35	Very limited Large stones content Slope Dusty	 1.00 1.00 0.50	Very limited Large stones content Dusty Slope	 1.00 0.50 0.22
Canyonfork-----	30	Somewhat limited Too sandy	 0.01	Somewhat limited Too sandy	 0.01
Cedarcabin-----	25	Very limited Large stones content Slope Dusty	 1.00 0.92 0.50	Very limited Large stones content Dusty	 1.00 0.50
1700: Eenreed-----	40	Somewhat limited Dusty Large stones content	 0.50 0.19	Somewhat limited Dusty Large stones content	 0.50 0.19
Millan-----	30	Very limited Slope Dusty Large stones content	 1.00 0.50 0.19	Somewhat limited Slope Dusty Large stones content	 0.56 0.50 0.19
Eenreed-----	15	Very limited Slope Dusty Large stones content	 1.00 0.50 0.19	Somewhat limited Slope Dusty Large stones content	 0.56 0.50 0.19
1900: Borvant-----	90	Very limited Gravel Dusty Slope	 1.00 0.50 0.08	Very limited Gravel Dusty	 1.00 0.50
2000: Closkey-----	85	Somewhat limited Too sandy Slope	 0.74 0.08	Somewhat limited Too sandy	 0.74
2101: Radol-----	40	Very limited Slope Large stones content	 1.00 0.76	Very limited Slope Large stones content	 1.00 0.76

TABLE 15.--TRAIL MANAGEMENT

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Logring-----	25	Very limited Slope Gravel Dusty	1.00 1.00 0.50	Very limited Slope Gravel Dusty	1.00 1.00 0.50
Rock outcrop-----	20	Not rated		Not rated	
2103: Radol-----	40	Very limited Slope Large stones content	1.00 0.76	Very limited Slope Large stones content	1.00 0.76
Hyzen-----	30	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 0.56
Rock outcrop-----	20	Not rated		Not rated	
2111: Garnel-----	70	Very limited Slope Large stones content	1.00 0.19	Very limited Slope Large stones content	1.00 0.19
Rock outcrop-----	25	Not rated		Not rated	
2430: Bellenmine-----	70	Very limited Large stones content Slope	1.00 0.50	Very limited Large stones content	1.00
Basinpeak-----	15	Very limited Large stones content Slope Dusty	1.00 1.00 0.50	Very limited Large stones content Slope Dusty	1.00 0.56 0.50
2432: Majorsplace-----	40	Very limited Large stones content Slope Dusty	1.00 0.50 0.50	Very limited Large stones content Dusty	1.00 0.50
Checkett-----	30	Very limited Large stones content Slope Dusty	1.00 1.00 0.50	Very limited Large stones content Slope Dusty	1.00 0.56 0.50
Grube-----	15	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 0.56
3344: Badena-----	60	Very limited Large stones content Dusty	1.00 0.50	Very limited Large stones content Dusty	1.00 0.50
Badena-----	25	Very limited Large stones content Slope	1.00 0.32	Very limited Large stones content	1.00
3439: Eaglepass-----	45	Very limited Large stones content Slope Dusty	1.00 1.00 0.50	Very limited Large stones content Slope Dusty	1.00 0.56 0.50
Rock outcrop-----	25	Not rated		Not rated	

TABLE 15.--TRAIL MANAGEMENT

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Amtoft-----	15	Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50
		Large stones content	0.19	Large stones content	0.19
		Slope	0.02		
3900: Osditch-----	85	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
4140: Lodar-----	35	Very limited		Somewhat limited	
		Slope	1.00	Slope	0.56
		Dusty	0.50	Dusty	0.50
		Large stones content	0.19	Large stones content	0.19
Monarch-----	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	0.19	Large stones content	0.19
Highup-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
		Gravel	1.00	Gravel	1.00
		Dusty	0.50	Dusty	0.50
4200: Wardbay-----	50	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Slope	1.00	Slope	0.56
Haunchee-----	20	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Dusty	0.50
		Dusty	0.50	Slope	0.22
Muiral-----	15	Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00
		Slope	1.00	Slope	1.00
5100: Logring-----	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel	1.00
		Dusty	0.50	Dusty	0.50
Hyzen-----	25	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	0.56
Canyoung-----	15	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Slope	1.00	Slope	0.56
		Dusty	0.50	Dusty	0.50
		Large stones content	0.19	Large stones content	0.19
5102: Canyoung-----	40	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Dusty	0.50	Dusty	0.50
		Large stones content	0.19	Large stones content	0.19
Zarark-----	30	Not limited		Not limited	
Wardbay-----	20	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Slope	0.92		

TABLE 15.--TRAIL MANAGEMENT

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5110: Garnel-----	45	Somewhat limited Slope Large stones content	0.50 0.19	Somewhat limited Large stones content	0.19
Garnel, very steep-----	30	Very limited Slope Large stones content	1.00 0.19	Very limited Slope Large stones content	1.00 0.19
Rock outcrop-----	15	Not rated		Not rated	
5140: Wardbay-----	45	Very limited Gravel Slope	1.00 0.50	Very limited Gravel	1.00
Canyoung-----	25	Very limited Slope Gravel Dusty Large stones content	1.00 1.00 0.50 0.19	Very limited Slope Gravel Dusty Large stones content	1.00 1.00 0.50 0.19
Rock outcrop-----	15	Not rated		Not rated	
5160: Hyzen-----	65	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 1.00
Rock outcrop-----	20	Not rated		Not rated	
5210: Badhap-----	35	Very limited Slope Large stones content	1.00 0.01	Very limited Slope Large stones content	1.00 0.01
Badhap-----	25	Very limited Slope	1.00	Somewhat limited Slope	0.56
Topeki-----	25	Very limited Large stones content Slope	1.00 0.32	Very limited Large stones content	1.00
5220: Basinpeak-----	60	Very limited Large stones content Slope Dusty	1.00 1.00 0.50	Very limited Large stones content Dusty Slope	1.00 0.50 0.22
Badhap-----	25	Very limited Slope	1.00	Somewhat limited Slope	0.56
5240: Wardbay-----	35	Very limited Gravel Slope	1.00 1.00	Very limited Gravel Slope	1.00 0.22
Haunchee-----	35	Very limited Large stones content Slope Dusty	1.00 1.00 0.50	Very limited Large stones content Dusty Slope	1.00 0.50 0.22
Bakerpeak-----	15	Very limited Slope Large stones content	1.00 0.23	Very limited Slope Large stones content	1.00 0.23

TABLE 15.--TRAIL MANAGEMENT

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5241:					
Haunchee-----	40	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50
Canyoung-----	30	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Slope	1.00	Slope	0.56
		Dusty	0.50	Dusty	0.50
		Large stones content	0.19	Large stones content	0.19
Rock outcrop-----	20	Not rated		Not rated	
5250:					
Bricone-----	55	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
Piar-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel	1.00
		Large stones content	0.19	Large stones content	0.19
Linpeak-----	15	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Slope	1.00	Slope	0.44
5251:					
Bricone-----	50	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
Piar-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel	1.00
		Large stones content	0.19	Large stones content	0.19
Rock outcrop-----	15	Not rated		Not rated	
5252:					
Bricone-----	60	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
Rock outcrop-----	30	Not rated		Not rated	
5253:					
Windwash-----	40	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Gravel	1.00	Gravel	1.00
		Slope	1.00	Too sandy	0.67
		Too sandy	0.67	Slope	0.22
Bricone-----	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
Rock outcrop-----	15	Not rated		Not rated	
5255:					
Wayhigh-----	90	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Too sandy	0.01	Too sandy	0.01

TABLE 15.--TRAIL MANAGEMENT

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5261: Jonlake-----	45	Very limited Slope Gravel Large stones content	1.00 1.00 0.76	Very limited Slope Gravel Large stones content	1.00 1.00 0.76
Badhap-----	25	Very limited Slope Large stones content	1.00 0.01	Somewhat limited Slope Large stones content	0.56 0.01
Berrycreek-----	15	Very limited Gravel Slope	1.00 1.00	Very limited Gravel Slope	1.00 0.56
5270: Bakerpeak-----	40	Very limited Slope Large stones content	1.00 0.23	Very limited Slope Large stones content	1.00 0.23
Canyoung-----	35	Very limited Gravel Slope Dusty Large stones content	1.00 1.00 0.50 0.19	Very limited Gravel Slope Dusty Large stones content	1.00 0.56 0.50 0.19
Rock outcrop-----	15	Not rated		Not rated	
5290: Keyole-----	40	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 1.00
Osditch-----	25	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 1.00
Topeki-----	20	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 1.00
5291: Keyole-----	50	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 1.00
Rubble land-----	35	Not rated		Not rated	
5292: Keyole-----	50	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 1.00
Osditch-----	35	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 1.00
5310: Jumble-----	55	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 0.22
Lemcave-----	30	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 0.22

TABLE 15.--TRAIL MANAGEMENT

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5311:					
Jumble-----	40	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	0.22
Lemcave-----	30	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	0.22
Gaia-----	15	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	0.56
		Dusty	0.50	Dusty	0.50
5320:					
Wardbay-----	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel	1.00
Wardbay, convex slopes--	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel	1.00
Basinpeak-----	20	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Dusty	0.50
		Dusty	0.50	Slope	0.44
5330:					
Rubble land-----	35	Not rated		Not rated	
Wheelerpek-----	30	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
Cobblywheel-----	25	Not rated		Not rated	
		Not rated; Surface		Not rated; Surface	
		Fragments > 75mm		Fragments > 75mm	
		Not rated; % surface sand		Not rated; % surface sand	
		or clay		or clay	
		Not rated; Surface clay		Not rated; Surface clay	
		percent or taxonomic class		percent or taxonomic class	
		Slope	1.00	Slope	0.44
5340:					
Linpeak-----	50	Very limited		Very limited	
		Gravel	1.00	Gravel	1.00
		Slope	1.00	Slope	0.44
Piar-----	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Gravel	1.00	Gravel	1.00
		Large stones content	0.19	Large stones content	0.19
Bricone-----	15	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones content	1.00	Large stones content	1.00
5350:					
Goodski-----	35	Very limited		Somewhat limited	
		Slope	1.00	Large stones content	0.76
		Large stones content	0.76	Slope	0.22
Kious-----	35	Very limited		Very limited	
		Large stones content	1.00	Large stones content	1.00
		Slope	1.00	Slope	1.00
		Too sandy	0.82	Too sandy	0.82

TABLE 15.--TRAIL MANAGEMENT

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Snacreek-----	15	Not rated Not rated; Surface Fragments > 75mm Slope	1.00	Not rated Not rated; Surface Fragments > 75mm Slope	0.22
5380: Ceebee-----	50	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 1.00
Strawbcrek-----	40	Very limited Slope Large stones content	1.00 1.00	Very limited Large stones content Slope	1.00 1.00
5381: Ceebee-----	50	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 1.00
Pirapeak-----	40	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 1.00
5410: Timmercrek-----	85	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 0.56
5420: Topeki-----	35	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 0.56
Badhap-----	35	Very limited Slope Large stones content	1.00 0.01	Somewhat limited Slope Large stones content	0.56 0.01
Jonlake-----	15	Very limited Gravel Large stones content Slope	1.00 0.76 0.50	Very limited Gravel Large stones content	1.00 0.76
5425: Ripcon-----	40	Not limited		Not limited	
Bigwash-----	30	Not limited		Not limited	
Glideski-----	15	Very limited Large stones content	1.00	Very limited Large stones content	1.00
5428: Rippo-----	45	Very limited Large stones content	1.00	Very limited Large stones content	1.00
Lehmandow-----	25	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Brokit-----	15	Very limited Large stones content	1.00	Very limited Large stones content	1.00
5430: Brokit-----	85	Very limited Large stones content	1.00	Very limited Large stones content	1.00
5432: Glideski-----	35	Very limited Large stones content	1.00	Very limited Large stones content	1.00

TABLE 15.--TRAIL MANAGEMENT

Map symbol and soil name	Pct. of map unit	Foot traffic and equestrian trails		Mountain bike and off-road vehicle trails	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Brokit-----	30	Very limited Large stones content	1.00	Very limited Large stones content	1.00
Lemcave-----	20	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content Slope	1.00 0.56
5434: Lehmandow-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
5440: Glaciers-----	85	Not rated		Not rated	

TABLE 16.--SEWAGE DISPOSAL

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1650: Noski-----	35	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Cedarcabin-----	25	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Depth to soft bedrock	1.00
		Slow water movement	0.99	Slope	1.00
				Seepage	0.01
Noski-----	25	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
1652: Noski-----	35	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Canyonfork-----	30	Somewhat limited Slow water movement	0.68	Very limited Slope	1.00
		Flooding	0.40	Flooding	0.40
		Slope	0.01	Seepage	0.32
Cedarcabin-----	25	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Depth to soft bedrock	1.00
		Slow water movement	0.99	Slope	1.00
				Seepage	0.01
1700: Eenreed-----	40	Somewhat limited Slope	0.16	Very limited Seepage	1.00
				Slope	1.00
Millan-----	30	Very limited Too steep	1.00	Very limited Slope	1.00
				Seepage	1.00
Eenreed-----	15	Very limited Too steep	1.00	Very limited Slope	1.00
				Seepage	1.00

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1900: Borvant-----	90	Very limited Depth to cemented pan Seepage, bottom layer Too steep	1.00 1.00 1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 1.00
2000: Closkey-----	85	Very limited Depth to bedrock Too steep Slow water movement	1.00 1.00 0.50	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 1.00
2101: Radol-----	40	Very limited Depth to bedrock Too steep Large stones	1.00 1.00 0.63	Very limited Depth to hard bedrock Slope Large stones Seepage	1.00 1.00 0.76 0.50
Logring-----	25	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00
Rock outcrop-----	20	Not rated		Not rated	
2103: Radol-----	40	Very limited Depth to bedrock Too steep Large stones	1.00 1.00 0.63	Very limited Depth to hard bedrock Slope Large stones Seepage	1.00 1.00 0.76 0.50
Hyzen-----	30	Very limited Depth to bedrock Too steep Large stones	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope Large stones	1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated	
2111: Garnel-----	70	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Depth to soft bedrock Slope	1.00 1.00 1.00
Rock outcrop-----	25	Not rated		Not rated	
2430: Bellenmine-----	70	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00
Basinpeak-----	15	Very limited Too steep Slow water movement Large stones	1.00 0.50 0.01	Very limited Slope Large stones Seepage	1.00 0.54 0.50

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2432: Majorsplace-----	40	Very limited Depth to bedrock Too steep Large stones	1.00 1.00 0.70	Very limited Depth to hard bedrock Slope Large stones	1.00 1.00 1.00
Checkett-----	30	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Slope Large stones	1.00 1.00 0.01
Grube-----	15	Very limited Too steep Slow water movement Large stones	1.00 1.00 1.00	Very limited Slope Large stones Seepage	1.00 1.00 0.50
3344: Badena-----	60	Very limited Large stones Too steep Slow water movement	1.00 1.00 0.50	Very limited Large stones Slope Seepage	1.00 1.00 0.50
Badena-----	25	Very limited Large stones Too steep Slow water movement	1.00 1.00 0.50	Very limited Slope Large stones Seepage	1.00 1.00 0.50
3439: Eaglepass-----	45	Very limited Depth to bedrock Too steep Large stones	1.00 1.00 0.04	Very limited Depth to hard bedrock Slope	1.00 1.00
Rock outcrop-----	25	Not rated		Not rated	
Amtoft-----	15	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00
3900: Osditch-----	85	Very limited Too steep Large stones Slow water movement	1.00 1.00 0.50	Very limited Slope Large stones Organic matter content Seepage	1.00 1.00 1.00 0.50
4140: Lodar-----	35	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 0.50
Monarch-----	30	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 0.50

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Highup-----	20	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
4200: Wardbay-----	50	Very limited Too steep	1.00	Very limited Slope	1.00
		Depth to bedrock	0.99	Depth to hard bedrock	0.96
		Slow water movement	0.50	Seepage	0.50
		Large stones	0.05		
Haunchee-----	20	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
				Seepage	0.18
Muiral-----	15	Very limited Depth to bedrock	1.00	Very limited Slope	1.00
		Too steep	1.00	Organic matter content	1.00
		Slow water movement	0.50	Depth to hard bedrock	0.99
				Seepage	0.50
5100: Logring-----	45	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
Hyzen-----	25	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
Canyoung-----	15	Very limited Too steep	1.00	Very limited Slope	1.00
		Slow water movement	0.50	Seepage	0.50
5102: Canyoung-----	40	Somewhat limited Slow water movement	0.50	Very limited Slope	1.00
		Slope	0.16	Seepage	0.50
Zarark-----	30	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Slow water movement	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
Wardbay-----	20	Very limited Too steep	1.00	Very limited Slope	1.00
		Depth to bedrock	0.99	Depth to hard bedrock	0.96
		Slow water movement	0.50	Seepage	0.50
		Large stones	0.05		

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5110: Garnel-----	45	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Depth to soft bedrock	1.00
				Slope	1.00
Garnel, very steep--	30	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Depth to soft bedrock	1.00
				Slope	1.00
Rock outcrop-----	15	Not rated		Not rated	
5140: Wardbay-----	45	Very limited Too steep	1.00	Very limited Slope	1.00
		Depth to bedrock	0.99	Depth to hard bedrock	0.96
		Slow water movement	0.50	Seepage	0.50
		Large stones	0.05		
Canyoung-----	25	Very limited Too steep	1.00	Very limited Slope	1.00
		Slow water movement	0.50	Seepage	0.50
Rock outcrop-----	15	Not rated		Not rated	
5160: Hyzen-----	65	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
Rock outcrop-----	20	Not rated		Not rated	
5210: Badhap-----	35	Very limited Too steep	1.00	Very limited Slope	1.00
		Large stones	1.00	Large stones	1.00
		Slow water movement	0.50	Seepage	0.50
Badhap-----	25	Very limited Too steep	1.00	Very limited Slope	1.00
		Large stones	1.00	Large stones	1.00
		Slow water movement	0.50	Seepage	0.50
Topeki-----	25	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Large stones	0.97	Large stones	1.00
				Seepage	0.50

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5220: Basinpeak-----	60	Very limited Too steep 1.00 Slow water 0.50 movement Large stones 0.01		Very limited Slope 1.00 Large stones 0.54 Seepage 0.50	
Badhap-----	25	Very limited Too steep 1.00 Large stones 1.00 Slow water 0.50 movement		Very limited Slope 1.00 Large stones 1.00 Seepage 0.50	
5240: Wardbay-----	35	Very limited Too steep 1.00 Depth to bedrock 0.99 Slow water 0.50 movement Large stones 0.05		Very limited Slope 1.00 Depth to hard 0.96 bedrock Seepage 0.50	
Haunchee-----	35	Very limited Depth to bedrock 1.00 Too steep 1.00		Very limited Depth to hard 1.00 bedrock Slope 1.00 Seepage 0.18	
Bakerpeak-----	15	Very limited Too steep 1.00 Seepage, bottom 1.00 layer		Very limited Slope 1.00 Seepage 1.00 Organic matter 1.00 content	
5241: Haunchee-----	40	Very limited Depth to bedrock 1.00 Too steep 1.00		Very limited Depth to hard 1.00 bedrock Slope 1.00 Seepage 0.18	
Canyoung-----	30	Very limited Too steep 1.00 Slow water 0.50 movement		Very limited Slope 1.00 Seepage 0.50	
Rock outcrop-----	20	Not rated		Not rated	
5250: Bricone-----	55	Very limited Depth to bedrock 1.00 Too steep 1.00		Very limited Depth to hard 1.00 bedrock Slope 1.00 Seepage 0.68	
Piar-----	15	Very limited Too steep 1.00 Depth to bedrock 0.63 Slow water 0.50 movement		Very limited Slope 1.00 Seepage 1.00 Organic matter 1.00 content Depth to hard 0.18 bedrock	

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Linpeak-----	15	Very limited Too steep Slow water movement	1.00 0.50	Very limited Slope Seepage Organic matter content	1.00 1.00 1.00
5251: Bricone-----	50	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 0.68
Piar-----	20	Very limited Too steep Depth to bedrock Slow water movement	1.00 0.63 0.50	Very limited Slope Seepage Organic matter content Depth to hard bedrock	1.00 1.00 1.00 0.18
Rock outcrop-----	15	Not rated		Not rated	
5252: Bricone-----	60	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 0.68
Rock outcrop-----	30	Not rated		Not rated	
5253: Windwash-----	40	Very limited Depth to bedrock Too steep Seepage, bottom layer	1.00 1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 1.00
Bricone-----	30	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 0.68
Rock outcrop-----	15	Not rated		Not rated	
5255: Wayhigh-----	90	Very limited Depth to bedrock Seepage, bottom layer Slope	1.00 1.00 0.01	Very limited Depth to hard bedrock Seepage Slope Organic matter content Large stones	1.00 1.00 1.00 1.00 0.01
5261: Jonlake-----	45	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 0.50

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Badhap-----	25	Very limited Too steep Large stones Slow water movement	 1.00 1.00 0.50	Very limited Slope Large stones Seepage	 1.00 1.00 0.50
Berrycreek-----	15	Very limited Too steep Slow water movement	 1.00 0.92	Very limited Slope Organic matter content Seepage	 1.00 1.00 0.08
5270: Bakerpeak-----	40	Very limited Too steep Seepage, bottom layer	 1.00 1.00	Very limited Slope Seepage Organic matter content	 1.00 1.00 1.00
Canyoung-----	35	Very limited Too steep Slow water movement	 1.00 0.50	Very limited Slope Seepage	 1.00 0.50
Rock outcrop-----	15	Not rated		Not rated	
5290: Keyole-----	40	Very limited Filtering capacity Too steep Seepage, bottom layer	 1.00 1.00 1.00	Very limited Slope Seepage Organic matter content Large stones	 1.00 1.00 1.00 0.57
Osditch-----	25	Very limited Too steep Large stones Slow water movement	 1.00 1.00 0.50	Very limited Slope Large stones Organic matter content Seepage	 1.00 1.00 1.00 0.50
Topeki-----	20	Very limited Depth to bedrock Too steep Large stones	 1.00 1.00 0.97	Very limited Depth to hard bedrock Slope Large stones Seepage	 1.00 1.00 1.00 0.50
5291: Keyole-----	50	Very limited Filtering capacity Too steep Seepage, bottom layer	 1.00 1.00 1.00	Very limited Slope Seepage Organic matter content Large stones	 1.00 1.00 1.00 0.57
Rubble land-----	35	Not rated		Not rated	

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5292: Keyole-----	50	Very limited Filtering capacity Too steep Seepage, bottom layer	1.00 1.00 1.00	Very limited Slope Seepage Organic matter content Large stones	1.00 1.00 1.00 0.57
Osditch-----	35	Very limited Too steep Large stones Slow water movement	1.00 1.00 0.50	Very limited Slope Large stones Organic matter content Seepage	1.00 1.00 1.00 0.50
5310: Jumble-----	55	Very limited Large stones Too steep Slow water movement	1.00 1.00 0.50	Very limited Slope Seepage Large stones Organic matter content	1.00 1.00 1.00 1.00
Lemcave-----	30	Very limited Seepage, bottom layer Too steep Large stones	1.00 1.00 0.77	Very limited Slope Seepage Large stones Organic matter content	1.00 1.00 1.00 1.00
5311: Jumble-----	40	Very limited Large stones Too steep Slow water movement	1.00 1.00 0.50	Very limited Slope Seepage Large stones Organic matter content	1.00 1.00 1.00 1.00
Lemcave-----	30	Very limited Seepage, bottom layer Too steep Large stones	1.00 1.00 0.77	Very limited Slope Seepage Large stones Organic matter content	1.00 1.00 1.00 1.00
Gaia-----	15	Very limited Too steep Seepage, bottom layer Large stones	1.00 1.00 0.71	Very limited Slope Seepage Large stones	1.00 1.00 1.00
5320: Wardbay-----	40	Very limited Too steep Depth to bedrock Slow water movement Large stones	1.00 0.99 0.50 0.05	Very limited Slope Depth to hard bedrock Seepage	1.00 0.96 0.50

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Wardbay, convex slopes-----	30	Very limited Too steep Depth to bedrock Slow water movement Large stones	 1.00 0.99 0.50 0.05	Very limited Slope Depth to hard bedrock Seepage	 1.00 0.96 0.50
Basinpeak-----	20	Very limited Too steep Slow water movement Large stones	 1.00 0.50 0.01	Very limited Slope Large stones Seepage	 1.00 0.54 0.50
5330: Rubble land-----	35	Not rated		Not rated	
Wheelerpek-----	30	Very limited Depth to bedrock Too steep Large stones Seepage, bottom layer	 1.00 1.00 1.00 1.00	Very limited Depth to hard bedrock Slope Seepage Large stones	 1.00 1.00 1.00 1.00
Cobblywheel-----	25	Very limited Too steep Large stones Slow water movement	 1.00 0.86 0.50	Very limited Slope Large stones Organic matter content Seepage	 1.00 1.00 1.00 0.50
5340: Linpeak-----	50	Very limited Too steep Slow water movement	 1.00 0.50	Very limited Slope Seepage Organic matter content	 1.00 1.00 1.00
Piar-----	20	Very limited Too steep Depth to bedrock Slow water movement	 1.00 0.63 0.50	Very limited Slope Seepage Organic matter content Depth to hard bedrock	 1.00 1.00 1.00 0.18
Bricone-----	15	Very limited Depth to bedrock Too steep	 1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	 1.00 1.00 0.68
5350: Goodski-----	35	Very limited Depth to bedrock Too steep Seepage, bottom layer Large stones	 1.00 1.00 1.00 0.04	Very limited Depth to hard bedrock Depth to soft bedrock Slope Seepage Large stones	 1.00 1.00 1.00 1.00 0.36

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Kious-----	35	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Too steep	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Snacreek-----	15	Very limited Too steep	1.00	Very limited Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Organic matter content	1.00
5380: Ceebee-----	50	Very limited Too steep	1.00	Very limited Slope	1.00
		Seepage, bottom layer	1.00	Large stones	1.00
		Large stones	0.98	Seepage	1.00
				Organic matter content	1.00
Strawbcrek-----	40	Very limited Too steep	1.00	Very limited Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Large stones	0.42	Organic matter content	1.00
				Large stones	0.76
5381: Ceebee-----	50	Very limited Too steep	1.00	Very limited Slope	1.00
		Seepage, bottom layer	1.00	Large stones	1.00
		Large stones	0.98	Seepage	1.00
				Organic matter content	1.00
Pirapeak-----	40	Very limited Too steep	1.00	Very limited Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Large stones	1.00	Large stones	1.00
		Filtering capacity	1.00	Organic matter content	1.00
5410: Timmercrek-----	85	Very limited Too steep	1.00	Very limited Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Organic matter content	1.00
5420: Topeki-----	35	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Too steep	1.00	Slope	1.00
		Large stones	0.97	Large stones	1.00
				Seepage	0.50

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Badhap-----	35	Very limited Too steep Large stones Slow water movement	 1.00 1.00 0.50	Very limited Slope Large stones Seepage	 1.00 1.00 0.50
Jonlake-----	15	Very limited Depth to bedrock Too steep	 1.00 1.00	Very limited Depth to hard bedrock Slope Seepage	 1.00 1.00 0.50
5425: Ripcon-----	40	Very limited Flooding Depth to saturated zone Seepage, bottom layer	 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage Slope	 1.00 1.00 1.00 0.68
Bigwash-----	30	Somewhat limited Slow water movement Flooding	 0.98 0.40	Somewhat limited Slope Flooding Seepage	 0.92 0.40 0.02
Glideski-----	15	Very limited Large stones Seepage, bottom layer Slow water movement Slope	 1.00 1.00 0.98 0.04	Very limited Seepage Slope Large stones	 1.00 1.00 1.00
5428: Rippo-----	45	Very limited Flooding Large stones Seepage, bottom layer Slope	 1.00 1.00 1.00 0.01	Very limited Flooding Large stones Seepage Slope Organic matter content	 1.00 1.00 1.00 1.00 1.00
Lehmandow-----	25	Very limited Flooding Slow water movement Depth to saturated zone Large stones	 1.00 1.00 1.00 0.83	Very limited Flooding Depth to saturated zone Slope Large stones	 1.00 1.00 0.68 0.62
Brokit-----	15	Very limited Flooding Depth to saturated zone Filtering capacity Seepage, bottom layer Large stones	 1.00 1.00 1.00 1.00 1.00	Very limited Flooding Large stones Seepage Depth to saturated zone Slope	 1.00 1.00 1.00 1.00 1.00

TABLE 16.--SEWAGE DISPOSAL

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5430: Brokit-----	85	Very limited Flooding 1.00 Depth to saturated zone 1.00 Filtering capacity 1.00 Seepage, bottom layer 1.00 Large stones 1.00		Very limited Flooding 1.00 Slope 1.00 Large stones 1.00 Seepage 1.00 Depth to saturated zone 1.00	
5432: Glideski-----	35	Very limited Large stones 1.00 Seepage, bottom layer 1.00 Slow water movement 0.98 Slope 0.04		Very limited Seepage 1.00 Slope 1.00 Large stones 1.00	
Brokit-----	30	Very limited Flooding 1.00 Depth to saturated zone 1.00 Filtering capacity 1.00 Seepage, bottom layer 1.00 Large stones 1.00		Very limited Flooding 1.00 Large stones 1.00 Seepage 1.00 Depth to saturated zone 1.00 Slope 1.00	
Lemcave-----	20	Very limited Too steep 1.00 Seepage, bottom layer 1.00 Large stones 0.77		Very limited Slope 1.00 Seepage 1.00 Large stones 1.00 Organic matter content 1.00	
5434: Lehmandow-----	90	Very limited Flooding 1.00 Slow water movement 1.00 Depth to saturated zone 1.00 Large stones 0.83		Very limited Flooding 1.00 Depth to saturated zone 1.00 Slope 0.68 Large stones 0.62	
5440: Glaciers-----	85	Not rated		Not rated	

TABLE 17.--PONDS AND EMBANKMENTS

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1650: Noski-----	35	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Seepage	1.00 0.50	Very limited Depth to water	1.00
Cedarcabin-----	25	Very limited Slope Depth to bedrock Seepage	1.00 0.69 0.11	Very limited Seepage Thin layer	1.00 0.83	Very limited Depth to water	1.00
Noski-----	25	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Seepage	1.00 0.50	Very limited Depth to water	1.00
1652: Noski-----	35	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Seepage	1.00 0.50	Very limited Depth to water	1.00
Canyonfork-----	30	Very limited Slope Seepage	1.00 0.57	Very limited Seepage	1.00	Very limited Depth to water	1.00
Cedarcabin-----	25	Very limited Slope Depth to bedrock Seepage	1.00 0.69 0.11	Very limited Seepage Thin layer	1.00 0.83	Very limited Depth to water	1.00
1700: Eenreed-----	40	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Millan-----	30	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Eenreed-----	15	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
1900: Borvant-----	90	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 1.00	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00
2000: Closkey-----	85	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.23	Very limited Seepage Thin layer	1.00 0.95	Very limited Depth to water	1.00
2101: Radol-----	40	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Large stones Seepage	1.00 0.63 0.60	Very limited Depth to water	1.00
Logring-----	25	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer	1.00	Very limited Depth to water	1.00

TABLE 17.--PONDS AND EMBANKMENTS

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Rock outcrop-----	20	Very limited Slope	1.00	Not rated		Not rated	
2103: Radol-----	40	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Large stones Seepage	1.00 0.63 0.60	Very limited Depth to water	1.00
Hyzen-----	30	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Large stones	1.00 1.00	Very limited Depth to water	1.00
Rock outcrop-----	20	Very limited Slope	1.00	Not rated		Not rated	
2111: Garnel-----	70	Very limited Slope Depth to bedrock	1.00 0.87	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00
Rock outcrop-----	25	Very limited Slope	1.00	Not rated		Not rated	
2430: Bellenmine-----	70	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00
Basinpeak-----	15	Very limited Slope Seepage	1.00 0.70	Very limited Seepage Large stones	1.00 0.01	Very limited Depth to water	1.00
2432: Majorsplace-----	40	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Seepage Large stones	1.00 0.93 0.70	Very limited Depth to water	1.00
Checkett-----	30	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer	1.00	Very limited Depth to water	1.00
Grube-----	15	Very limited Slope Seepage	1.00 0.70	Very limited Large stones Seepage	1.00 0.36	Very limited Depth to water	1.00
3344: Badena-----	60	Very limited Slope Seepage	1.00 0.70	Very limited Seepage Large stones	1.00 1.00	Very limited Depth to water	1.00
Badena-----	25	Very limited Slope Seepage	1.00 0.70	Very limited Seepage Large stones	1.00 1.00	Very limited Depth to water	1.00
3439: Eaglepass-----	45	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Large stones	1.00 0.04	Very limited Depth to water	1.00
Rock outcrop-----	25	Very limited Slope	1.00	Not rated		Not rated	
Amtoft-----	15	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Thin layer Seepage	1.00 0.75	Very limited Depth to water	1.00

TABLE 17.--PONDS AND EMBANKMENTS

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3900: Osditch-----	85	Very limited Slope Seepage	1.00 0.70	Very limited Seepage Large stones	1.00 1.00	Very limited Depth to water	1.00
4140: Lodar-----	35	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00
Monarch-----	30	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Seepage	1.00 0.75	Very limited Depth to water	1.00
Highup-----	20	Very limited Slope Depth to bedrock Seepage	1.00 0.96 0.70	Very limited Seepage Thin layer	1.00 0.96	Very limited Depth to water	1.00
4200: Wardbay-----	50	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.37	Somewhat limited Seepage Thin layer Large stones	0.73 0.37 0.05	Very limited Depth to water	1.00
Haunchee-----	20	Very limited Slope Depth to bedrock Seepage	1.00 1.00 0.24	Very limited Seepage Thin layer Piping	1.00 1.00 0.22	Very limited Depth to water	1.00
Muiral-----	15	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.50	Somewhat limited Thin layer	0.50	Very limited Depth to water	1.00
5100: Logring-----	45	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer	1.00	Very limited Depth to water	1.00
Hyzen-----	25	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Large stones	1.00 1.00	Very limited Depth to water	1.00
Canyoung-----	15	Very limited Slope Seepage	1.00 0.70	Very limited Seepage	1.00	Very limited Depth to water	1.00
5102: Canyoung-----	40	Very limited Slope Seepage	1.00 0.70	Very limited Seepage	1.00	Very limited Depth to water	1.00
Zarark-----	30	Very limited Slope Depth to bedrock Seepage	1.00 0.92 0.70	Very limited Seepage Thin layer	1.00 0.92	Very limited Depth to water	1.00
Wardbay-----	20	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.37	Somewhat limited Seepage Thin layer Large stones	0.73 0.37 0.05	Very limited Depth to water	1.00
5110: Garnel-----	45	Very limited Slope Depth to bedrock	1.00 0.87	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00

TABLE 17.--PONDS AND EMBANKMENTS

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Garnel, very steep--	30	Very limited Slope Depth to bedrock	1.00 0.87	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00
Rock outcrop-----	15	Very limited Slope	1.00	Not rated		Not rated	
5140: Wardbay-----	45	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.37	Somewhat limited Seepage Thin layer Large stones	0.73 0.37 0.05	Very limited Depth to water	1.00
Canyoung-----	25	Very limited Slope Seepage	1.00 0.70	Very limited Seepage	1.00	Very limited Depth to water	1.00
Rock outcrop-----	15	Very limited Slope	1.00	Not rated		Not rated	
5160: Hyzen-----	65	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Large stones	1.00 1.00	Very limited Depth to water	1.00
Rock outcrop-----	20	Very limited Slope	1.00	Not rated		Not rated	
5210: Badhap-----	35	Very limited Slope Seepage	1.00 0.70	Very limited Large stones Seepage	1.00 0.20	Very limited Depth to water	1.00
Badhap-----	25	Very limited Slope Seepage	1.00 0.70	Very limited Large stones Seepage	1.00 0.20	Very limited Depth to water	1.00
Topeki-----	25	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Large stones Seepage	1.00 0.97 0.17	Very limited Depth to water	1.00
5220: Basinpeak-----	60	Very limited Slope Seepage	1.00 0.70	Very limited Seepage Large stones	1.00 0.01	Very limited Depth to water	1.00
Badhap-----	25	Very limited Slope Seepage	1.00 0.70	Very limited Large stones Seepage	1.00 0.20	Very limited Depth to water	1.00
5240: Wardbay-----	35	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.37	Somewhat limited Seepage Thin layer Large stones	0.73 0.37 0.05	Very limited Depth to water	1.00
Haunchee-----	35	Very limited Slope Depth to bedrock Seepage	1.00 1.00 0.24	Very limited Seepage Thin layer Piping	1.00 1.00 0.22	Very limited Depth to water	1.00
Bakerpeak-----	15	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00

TABLE 17.--PONDS AND EMBANKMENTS

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5241:							
Haunchee-----	40	Very limited Slope Depth to bedrock Seepage	1.00 1.00 0.24	Very limited Seepage Thin layer Piping	1.00 1.00 0.22	Very limited Depth to water	1.00
Canyoung-----	30	Very limited Slope Seepage	1.00 0.70	Very limited Seepage	1.00	Very limited Depth to water	1.00
Rock outcrop-----	20	Very limited Slope	1.00	Not rated		Not rated	
5250:							
Bricone-----	55	Very limited Slope Depth to bedrock Seepage	1.00 1.00 0.11	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00
Piar-----	15	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.04	Very limited Seepage Thin layer	1.00 0.04	Very limited Depth to water	1.00
Linpeak-----	15	Very limited Slope Seepage	1.00 0.70	Somewhat limited Seepage	0.96	Very limited Depth to water	1.00
5251:							
Bricone-----	50	Very limited Slope Depth to bedrock Seepage	1.00 1.00 0.11	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00
Piar-----	20	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.04	Very limited Seepage Thin layer	1.00 0.04	Very limited Depth to water	1.00
Rock outcrop-----	15	Very limited Slope	1.00	Not rated		Not rated	
5252:							
Bricone-----	60	Very limited Slope Depth to bedrock Seepage	1.00 1.00 0.11	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00
Rock outcrop-----	30	Very limited Slope	1.00	Not rated		Not rated	
5253:							
Windwash-----	40	Very limited Slope Seepage Depth to bedrock	1.00 1.00 0.99	Very limited Seepage Thin layer	1.00 0.99	Very limited Depth to water	1.00
Bricone-----	30	Very limited Slope Depth to bedrock Seepage	1.00 1.00 0.11	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00
Rock outcrop-----	15	Very limited Slope	1.00	Not rated		Not rated	

TABLE 17.--PONDS AND EMBANKMENTS

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5255: Wayhigh-----	90	Very limited Seepage Slope Depth to bedrock	1.00 1.00 0.69	Very limited Seepage Thin layer	1.00 0.70	Very limited Depth to water	1.00
5261: Jonlake-----	45	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00
Badhap-----	25	Very limited Slope Seepage	1.00 0.70	Very limited Large stones Seepage	1.00 0.20	Very limited Depth to water	1.00
Berrycreek-----	15	Very limited Slope Seepage	1.00 0.30	Very limited Seepage	1.00	Very limited Depth to water	1.00
5270: Bakerpeak-----	40	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Canyoung-----	35	Very limited Slope Seepage	1.00 0.70	Very limited Seepage	1.00	Very limited Depth to water	1.00
Rock outcrop-----	15	Very limited Slope	1.00	Not rated		Not rated	
5290: Keyole-----	40	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Osditch-----	25	Very limited Slope Seepage	1.00 0.70	Very limited Seepage Large stones	1.00 1.00	Very limited Depth to water	1.00
Topeki-----	20	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Thin layer Large stones Seepage	1.00 0.97 0.17	Very limited Depth to water	1.00
5291: Keyole-----	50	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Rubble land-----	35	Very limited Slope	1.00	Not rated		Not rated	
5292: Keyole-----	50	Very limited Seepage Slope	1.00 1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
Osditch-----	35	Very limited Slope Seepage	1.00 0.70	Very limited Seepage Large stones	1.00 1.00	Very limited Depth to water	1.00
5310: Jumble-----	55	Very limited Slope Seepage	1.00 0.70	Very limited Seepage Large stones	1.00 1.00	Very limited Depth to water	1.00

TABLE 17.--PONDS AND EMBANKMENTS

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lemcave-----	30	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Large stones	1.00 0.77	Very limited Depth to water	1.00
5311: Jumble-----	40	Very limited Slope Seepage	1.00 0.70	Very limited Seepage Large stones	1.00 1.00	Very limited Depth to water	1.00
Lemcave-----	30	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Large stones	1.00 0.77	Very limited Depth to water	1.00
Gaia-----	15	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Large stones	1.00 0.71	Very limited Depth to water	1.00
5320: Wardbay-----	40	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.37	Somewhat limited Seepage Thin layer Large stones	0.73 0.37 0.05	Very limited Depth to water	1.00
Wardbay, convex slopes-----	30	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.37	Somewhat limited Seepage Thin layer Large stones	0.73 0.37 0.05	Very limited Depth to water	1.00
Basinpeak-----	20	Very limited Slope Seepage	1.00 0.70	Very limited Seepage Large stones	1.00 0.01	Very limited Depth to water	1.00
5330: Rubble land-----	35	Very limited Slope	1.00	Not rated		Not rated	
Wheelerpek-----	30	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Seepage Thin layer Large stones	1.00 1.00 1.00	Very limited Depth to water	1.00
Cobblywheel-----	25	Very limited Slope Seepage	1.00 0.70	Very limited Seepage Large stones	1.00 0.86	Very limited Depth to water	1.00
5340: Linpeak-----	50	Very limited Slope Seepage	1.00 0.70	Somewhat limited Seepage	0.96	Very limited Depth to water	1.00
Piar-----	20	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.04	Very limited Seepage Thin layer	1.00 0.04	Very limited Depth to water	1.00
Bricone-----	15	Very limited Slope Depth to bedrock Seepage	1.00 1.00 0.11	Very limited Seepage Thin layer	1.00 1.00	Very limited Depth to water	1.00
5350: Goodski-----	35	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Thin layer	1.00 0.91	Very limited Depth to water	1.00

TABLE 17.--PONDS AND EMBANKMENTS

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to bedrock	0.86	Large stones	0.04		
Kious-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Seepage	1.00	Depth to water	1.00
		Depth to bedrock	0.50	Thin layer	1.00		
Snacreek-----	15	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00				
5380: Ceebee-----	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00	Large stones	0.98		
Strawbcrek-----	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00	Large stones	0.42		
5381: Ceebee-----	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00	Large stones	0.98		
Pirapeak-----	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00	Large stones	1.00		
5410: Timmercrek-----	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00				
5420: Topeki-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Large stones	0.97		
				Seepage	0.17		
Badhap-----	35	Very limited		Very limited		Very limited	
		Slope	1.00	Large stones	1.00	Depth to water	1.00
		Seepage	0.70	Seepage	0.20		
Jonlake-----	15	Very limited		Very limited		Very limited	
		Slope	1.00	Seepage	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Thin layer	1.00		
5425: Ripcon-----	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Cutbanks cave	1.00
		Slope	0.32	Depth to saturated zone	0.68	Depth to saturated zone	0.14
Bigwash-----	30	Somewhat limited		Not limited		Very limited	
		Slope	0.68			Depth to water	1.00
		Seepage	0.19				
Glideski-----	15	Very limited		Very limited		Very limited	
		Seepage	1.00	Large stones	1.00	Depth to water	1.00
		Slope	1.00	Seepage	0.42		
5428: Rippo-----	45	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00	Large stones	1.00		

TABLE 17.--PONDS AND EMBANKMENTS

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lehmandow-----	25	Somewhat limited Slope	0.32	Very limited Depth to saturated zone Large stones	1.00 0.83	Somewhat limited Slow refill Large stones Cutbanks cave	0.95 0.83 0.10
Brokit-----	15	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Large stones Depth to saturated zone	1.00 1.00 0.53	Very limited Cutbanks cave Large stones Depth to saturated zone	1.00 1.00 0.21
5430: Brokit-----	85	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Large stones Depth to saturated zone	1.00 1.00 0.53	Very limited Cutbanks cave Large stones Depth to saturated zone	1.00 1.00 0.21
5432: Glideski-----	35	Very limited Seepage Slope	1.00 1.00	Very limited Large stones Seepage	1.00 0.42	Very limited Depth to water	1.00
Brokit-----	30	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Large stones Depth to saturated zone	1.00 1.00 0.53	Very limited Cutbanks cave Large stones Depth to saturated zone	1.00 1.00 0.21
Lemcave-----	20	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Large stones	1.00 0.77	Very limited Depth to water	1.00
5434: Lehmandow-----	90	Somewhat limited Slope	0.32	Very limited Depth to saturated zone Large stones	1.00 0.83	Somewhat limited Slow refill Large stones Cutbanks cave	0.95 0.83 0.10
5440: Glaciers-----	85	Very limited Slope	1.00	Not rated		Not rated	

TABLE 18.--DWELLINGS AND SMALL COMMERCIAL BUILDINGS

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1650: Noski-----	35	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Cedarcabin-----	25	Very limited Too steep Shrink-swell Depth to hard bedrock	1.00 0.22 0.10	Very limited Too steep Depth to hard bedrock Depth to soft bedrock Shrink-swell	1.00 1.00 0.35 0.22	Very limited Slope Shrink-swell Depth to hard bedrock	1.00 0.22 0.10
Noski-----	25	Very limited Depth to hard bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Too steep	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
1652: Noski-----	35	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Canyonfork-----	30	Very limited Flooding Slope	1.00 0.01	Very limited Flooding Slope	1.00 0.01	Very limited Flooding Slope	1.00 1.00
Cedarcabin-----	25	Very limited Too steep Shrink-swell Depth to hard bedrock	1.00 0.22 0.10	Very limited Too steep Depth to hard bedrock Depth to soft bedrock Shrink-swell	1.00 1.00 0.35 0.22	Very limited Slope Shrink-swell Depth to hard bedrock	1.00 0.22 0.10
1700: Eenreed-----	40	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
Millan-----	30	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
Eenreed-----	15	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
1900: Borvant-----	90	Very limited Too steep Depth to thin cemented pan	1.00 0.50	Very limited Depth to thin cemented pan Too steep	1.00 1.00	Very limited Depth to thin cemented pan Slope	1.00 1.00
2000: Closkey-----	85	Very limited Too steep	1.00	Very limited Too steep Depth to soft bedrock	1.00 0.79	Very limited Slope	1.00

TABLE 18.--DWELLINGS AND SMALL COMMERCIAL BUILDINGS

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2101:							
Radol-----	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.63	Large stones	0.63	Large stones	0.63
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Logring-----	25	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
2103:							
Radol-----	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.63	Large stones	0.63	Large stones	0.63
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Hyzen-----	30	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
2111:							
Garnel-----	70	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Depth to hard bedrock	1.00	Depth to soft bedrock	1.00
		Depth to hard bedrock	0.50	Depth to soft bedrock	1.00	Depth to hard bedrock	0.50
Rock outcrop-----	25	Not rated		Not rated		Not rated	
2430:							
Bellenmine-----	70	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Too steep	1.00	Too steep	1.00	Depth to hard bedrock	1.00
Basinpeak-----	15	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Large stones	0.01	Large stones	0.01	Large stones	0.01
2432:							
Majorsplace-----	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Too steep	1.00	Too steep	1.00	Depth to hard bedrock	1.00
		Large stones	0.70	Large stones	0.70	Large stones	0.70
		Shrink-swell	0.22	Shrink-swell	0.22	Shrink-swell	0.22
Checkett-----	30	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00

TABLE 18.--DWELLINGS AND SMALL COMMERCIAL BUILDINGS

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Grube-----	15	Very limited Too steep Large stones	1.00 1.00	Very limited Too steep Large stones	1.00 1.00	Very limited Slope Large stones	1.00 1.00
3344: Badena-----	60	Very limited Large stones Too steep	1.00 1.00	Very limited Large stones Too steep	1.00 1.00	Very limited Large stones Slope	1.00 1.00
Badena-----	25	Very limited Large stones Too steep	1.00 1.00	Very limited Large stones Too steep	1.00 1.00	Very limited Slope Large stones	1.00 1.00
3439: Eaglepass-----	45	Very limited Too steep Depth to hard bedrock Large stones	1.00 1.00 0.04	Very limited Too steep Depth to hard bedrock Large stones	1.00 1.00 0.04	Very limited Slope Depth to hard bedrock Large stones	1.00 1.00 0.04
Rock outcrop-----	25	Not rated		Not rated		Not rated	
Amtoft-----	15	Very limited Depth to hard bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Slope	1.00 1.00
3900: Osditch-----	85	Very limited Too steep Large stones	1.00 1.00	Very limited Too steep Large stones	1.00 1.00	Very limited Slope Large stones	1.00 1.00
4140: Lodar-----	35	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Monarch-----	30	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Highup-----	20	Very limited Too steep Depth to hard bedrock	1.00 0.84	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 0.84
4200: Wardbay-----	50	Very limited Too steep Shrink-swell Large stones	1.00 0.50 0.05	Very limited Too steep Depth to hard bedrock Shrink-swell Large stones	1.00 0.96 0.50 0.05	Very limited Slope Shrink-swell Large stones	1.00 0.50 0.05
Haunchee-----	20	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Muiral-----	15	Very limited Too steep	1.00	Very limited Too steep Depth to hard bedrock	1.00 0.99	Very limited Slope	1.00

TABLE 18.--DWELLINGS AND SMALL COMMERCIAL BUILDINGS

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5100: Logring-----	45	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Hyzen-----	25	Very limited Too steep Depth to hard bedrock Large stones	1.00 1.00 1.00	Very limited Too steep Depth to hard bedrock Large stones	1.00 1.00 1.00	Very limited Slope Depth to hard bedrock Large stones	1.00 1.00 1.00
Canyoung-----	15	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
5102: Canyoung-----	40	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
Zarark-----	30	Somewhat limited Depth to hard bedrock Slope	0.68 0.16	Very limited Depth to hard bedrock Slope	1.00 0.16	Very limited Slope Depth to hard bedrock	1.00 0.68
Wardbay-----	20	Very limited Too steep Shrink-swell Large stones	1.00 0.50 0.05	Very limited Too steep Depth to hard bedrock Shrink-swell Large stones	1.00 0.96 0.50 0.05	Very limited Slope Shrink-swell Large stones	1.00 0.50 0.05
5110: Garnel-----	45	Very limited Too steep Depth to soft bedrock Depth to hard bedrock	1.00 0.50 0.50	Very limited Depth to hard bedrock Depth to soft bedrock Too steep	1.00 1.00 1.00	Very limited Slope Depth to soft bedrock Depth to hard bedrock	1.00 1.00 0.50
Garnel, very steep--	30	Very limited Too steep Depth to soft bedrock Depth to hard bedrock	1.00 0.50 0.50	Very limited Too steep Depth to hard bedrock Depth to soft bedrock	1.00 1.00 1.00	Very limited Slope Depth to soft bedrock Depth to hard bedrock	1.00 1.00 0.50
Rock outcrop-----	15	Not rated		Not rated		Not rated	
5140: Wardbay-----	45	Very limited Too steep Shrink-swell Large stones	1.00 0.50 0.05	Very limited Too steep Depth to hard bedrock Shrink-swell Large stones	1.00 0.96 0.50 0.05	Very limited Slope Shrink-swell Large stones	1.00 0.50 0.05
Canyoung-----	25	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	

TABLE 18.--DWELLINGS AND SMALL COMMERCIAL BUILDINGS

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5160:							
Hyzen-----	65	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
5210:							
Badhap-----	35	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
Badhap-----	25	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
Topeki-----	25	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Too steep	1.00	Too steep	1.00	Depth to hard bedrock	1.00
		Large stones	0.97	Large stones	0.97	Large stones	0.97
5220:							
Basinpeak-----	60	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Large stones	0.01	Large stones	0.01	Large stones	0.01
Badhap-----	25	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
5240:							
Wardbay-----	35	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Shrink-swell	0.50	Depth to hard bedrock	0.96	Shrink-swell	0.50
		Large stones	0.05	Shrink-swell	0.50	Large stones	0.05
				Large stones	0.05		
Haunchee-----	35	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Bakerpeak-----	15	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
5241:							
Haunchee-----	40	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Canyoung-----	30	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
5250:							
Bricone-----	55	Very limited		Very limited		Very limited	
		Too steep	1.00	Too steep	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00

TABLE 18.--DWELLINGS AND SMALL COMMERCIAL BUILDINGS

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Piar-----	15	Very limited Too steep	1.00	Very limited Too steep Depth to hard bedrock	1.00 0.18	Very limited Slope	1.00
Linpeak-----	15	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
5251: Bricone-----	50	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Piar-----	20	Very limited Too steep	1.00	Very limited Too steep Depth to hard bedrock	1.00 0.18	Very limited Slope	1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
5252: Bricone-----	60	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Rock outcrop-----	30	Not rated		Not rated		Not rated	
5253: Windwash-----	40	Very limited Too steep Depth to hard bedrock	1.00 0.97	Very limited Depth to hard bedrock Too steep	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 0.97
Bricone-----	30	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
5255: Wayhigh-----	90	Somewhat limited Depth to hard bedrock Slope	0.10 0.01	Very limited Depth to hard bedrock Slope	1.00 0.01	Very limited Slope Depth to hard bedrock	1.00 0.10
5261: Jonlake-----	45	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
Badhap-----	25	Very limited Too steep Large stones	1.00 1.00	Very limited Too steep Large stones	1.00 1.00	Very limited Slope Large stones	1.00 1.00
Berrycreek-----	15	Very limited Too steep Shrink-swell	1.00 0.50	Very limited Too steep Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50

TABLE 18.--DWELLINGS AND SMALL COMMERCIAL BUILDINGS

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5270:							
Bakerpeak-----	40	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
Canyoung-----	35	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
5290:							
Keyole-----	40	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
Osditch-----	25	Very limited Too steep Large stones	1.00 1.00	Very limited Too steep Large stones	1.00 1.00	Very limited Slope Large stones	1.00 1.00
Topeki-----	20	Very limited Too steep Depth to hard bedrock Large stones	1.00 1.00 1.00 0.97	Very limited Too steep Depth to hard bedrock Large stones	1.00 1.00 1.00 0.97	Very limited Slope Depth to hard bedrock Large stones	1.00 1.00 1.00 0.97
5291:							
Keyole-----	50	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
Rubble land-----	35	Not rated		Not rated		Not rated	
5292:							
Keyole-----	50	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
Osditch-----	35	Very limited Too steep Large stones	1.00 1.00	Very limited Too steep Large stones	1.00 1.00	Very limited Slope Large stones	1.00 1.00
5310:							
Jumble-----	55	Very limited Large stones Too steep	1.00 1.00	Very limited Large stones Too steep	1.00 1.00	Very limited Slope Large stones	1.00 1.00
Lemcave-----	30	Very limited Too steep Large stones	1.00 0.77	Very limited Too steep Large stones	1.00 0.77	Very limited Slope Large stones	1.00 0.77
5311:							
Jumble-----	40	Very limited Large stones Too steep	1.00 1.00	Very limited Large stones Too steep	1.00 1.00	Very limited Slope Large stones	1.00 1.00
Lemcave-----	30	Very limited Too steep Large stones	1.00 0.77	Very limited Too steep Large stones	1.00 0.77	Very limited Slope Large stones	1.00 0.77
Gaia-----	15	Very limited Too steep Large stones	1.00 0.71	Very limited Too steep Large stones	1.00 0.71	Very limited Slope Large stones	1.00 0.71
5320:							
Wardbay-----	40	Very limited Too steep Shrink-swell Large stones	1.00 0.50 0.05	Very limited Too steep Depth to hard bedrock Shrink-swell Large stones	1.00 0.96 0.50 0.05	Very limited Slope Shrink-swell Large stones	1.00 0.50 0.05

TABLE 18.--DWELLINGS AND SMALL COMMERCIAL BUILDINGS

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wardbay, convex slopes-----	30	Very limited Too steep Shrink-swell Large stones	1.00 0.50 0.05	Very limited Too steep Depth to hard bedrock Shrink-swell Large stones	1.00 0.96 0.50 0.05	Very limited Slope Shrink-swell Large stones	1.00 0.50 0.05
Basinpeak-----	20	Very limited Too steep Large stones	1.00 0.01	Very limited Too steep Large stones	1.00 0.01	Very limited Slope Large stones	1.00 0.01
5330: Rubble land-----	35	Not rated		Not rated		Not rated	
Wheelerpek-----	30	Very limited Too steep Depth to hard bedrock Large stones	1.00 1.00 1.00	Very limited Too steep Depth to hard bedrock Large stones	1.00 1.00 1.00	Very limited Slope Depth to hard bedrock Large stones	1.00 1.00 1.00
Cobblywheel-----	25	Very limited Too steep Large stones	1.00 0.86	Very limited Too steep Large stones	1.00 0.86	Very limited Slope Large stones	1.00 0.86
5340: Linpeak-----	50	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
Piar-----	20	Very limited Too steep	1.00	Very limited Too steep Depth to hard bedrock	1.00 0.18	Very limited Slope	1.00
Bricone-----	15	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Too steep Depth to hard bedrock	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
5350: Goodski-----	35	Very limited Too steep Depth to hard bedrock Large stones	1.00 0.46 0.04	Very limited Depth to hard bedrock Too steep Depth to soft bedrock Large stones	1.00 1.00 0.64 0.04	Very limited Slope Depth to hard bedrock Large stones	1.00 0.46 0.04
Kious-----	35	Very limited Too steep Depth to soft bedrock	1.00 0.50	Very limited Too steep Depth to soft bedrock	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Snacreek-----	15	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
5380: Ceebee-----	50	Very limited Too steep Large stones	1.00 0.98	Very limited Too steep Large stones	1.00 0.98	Very limited Slope Large stones	1.00 0.98
Strawbcrek-----	40	Very limited Too steep Large stones	1.00 0.42	Very limited Too steep Large stones	1.00 0.42	Very limited Slope Large stones	1.00 0.42

TABLE 18.--DWELLINGS AND SMALL COMMERCIAL BUILDINGS

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5381: Ceebee-----	50	Very limited Too steep Large stones	1.00 0.98	Very limited Too steep Large stones	1.00 0.98	Very limited Slope Large stones	1.00 0.98
Pirapeak-----	40	Very limited Too steep Large stones	1.00 1.00	Very limited Too steep Large stones	1.00 1.00	Very limited Slope Large stones	1.00 1.00
5410: Timmercrek-----	85	Very limited Too steep	1.00	Very limited Too steep	1.00	Very limited Slope	1.00
5420: Topeki-----	35	Very limited Too steep Depth to hard bedrock Large stones	1.00 1.00 0.97	Very limited Too steep Depth to hard bedrock Large stones	1.00 1.00 0.97	Very limited Slope Depth to hard bedrock Large stones	1.00 1.00 0.97
Badhap-----	35	Very limited Too steep Large stones	1.00 1.00	Very limited Too steep Large stones	1.00 1.00	Very limited Slope Large stones	1.00 1.00
Jonlake-----	15	Very limited Depth to hard bedrock Too steep	1.00 1.00	Very limited Depth to hard bedrock Too steep	1.00 1.00	Very limited Slope Depth to hard bedrock	1.00 1.00
5425: Ripcon-----	40	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.99	Very limited Flooding Slope	1.00 0.12
Bigwash-----	30	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Slope	1.00 0.50
Glideski-----	15	Very limited Large stones Shrink-swell Slope	1.00 0.50 0.04	Very limited Large stones Shrink-swell Slope	1.00 0.50 0.04	Very limited Large stones Slope Shrink-swell	1.00 1.00 0.50
5428: Rippo-----	45	Very limited Flooding Large stones Slope	1.00 1.00 0.01	Very limited Flooding Large stones Slope	1.00 1.00 0.01	Very limited Flooding Large stones Slope	1.00 1.00 1.00
Lehmandow-----	25	Very limited Flooding Depth to saturated zone Large stones Shrink-swell	1.00 1.00 0.83 0.50	Very limited Flooding Depth to saturated zone Large stones Shrink-swell	1.00 1.00 0.83 0.50	Very limited Flooding Depth to saturated zone Large stones Shrink-swell Slope	1.00 1.00 0.83 0.50 0.12
Brokit-----	15	Very limited Flooding Large stones Slope	1.00 1.00 0.16	Very limited Flooding Large stones Depth to saturated zone Slope	1.00 1.00 0.97 0.16	Very limited Flooding Large stones Slope	1.00 1.00 1.00

TABLE 18.--DWELLINGS AND SMALL COMMERCIAL BUILDINGS

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5430: Brokit-----	85	Very limited Flooding Large stones Slope	1.00 1.00 0.63	Very limited Flooding Large stones Depth to saturated zone Slope	1.00 1.00 0.97 0.63	Very limited Slope Flooding Large stones	1.00 1.00 1.00
5432: Glideski-----	35	Very limited Large stones Shrink-swell Slope	1.00 0.50 0.04	Very limited Large stones Shrink-swell Slope	1.00 0.50 0.04	Very limited Large stones Slope Shrink-swell	1.00 1.00 0.50
Brokit-----	30	Very limited Flooding Large stones Slope	1.00 1.00 0.04	Very limited Flooding Large stones Depth to saturated zone Slope	1.00 1.00 0.97 0.04	Very limited Flooding Large stones Slope	1.00 1.00 1.00
Lemcave-----	20	Very limited Too steep Large stones	1.00 0.77	Very limited Too steep Large stones	1.00 0.77	Very limited Slope Large stones	1.00 0.77
5434: Lehmandow-----	90	Very limited Flooding Depth to saturated zone Large stones Shrink-swell	1.00 1.00 0.83 0.50	Very limited Flooding Depth to saturated zone Large stones Shrink-swell	1.00 1.00 0.83 0.50	Very limited Flooding Depth to saturated zone Large stones Shrink-swell Slope	1.00 1.00 0.83 0.50 0.12
5440: Glaciers-----	85	Not rated		Not rated		Not rated	

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1650: Noski-----	35	Very limited Depth to hard bedrock Too steep Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Cutbanks cave	1.00 1.00 0.10
Cedarcabin-----	25	Very limited Too steep Frost action Shrink-swell Depth to hard bedrock	1.00 0.50 0.22 0.10	Very limited Depth to hard bedrock Too steep Cutbanks cave Depth to soft bedrock	1.00 1.00 1.00 0.35
Noski-----	25	Very limited Depth to hard bedrock Too steep Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Cutbanks cave	1.00 1.00 0.10
1652: Noski-----	35	Very limited Depth to hard bedrock Too steep Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Cutbanks cave	1.00 1.00 0.10
Canyonfork-----	30	Somewhat limited Frost action Flooding Slope	0.50 0.40 0.01	Very limited Cutbanks cave Slope	1.00 0.01
Cedarcabin-----	25	Very limited Too steep Frost action Shrink-swell Depth to hard bedrock	1.00 0.50 0.22 0.10	Very limited Depth to hard bedrock Too steep Cutbanks cave Depth to soft bedrock	1.00 1.00 1.00 0.35
1700: Eenreed-----	40	Somewhat limited Frost action Slope	0.50 0.16	Very limited Cutbanks cave Slope	1.00 0.16
Millan-----	30	Very limited Too steep Frost action	1.00 0.50	Very limited Too steep Cutbanks cave	1.00 1.00

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Eenreed-----	15	Very limited Too steep Frost action	1.00 0.50	Very limited Too steep Cutbanks cave	1.00 1.00
1900: Borvant-----	90	Very limited Depth to thin cemented pan Too steep Frost action	1.00 1.00 0.50	Very limited Depth to thin cemented pan Cutbanks cave Too steep	1.00 1.00 1.00
2000: Closkey-----	85	Very limited Too steep Frost action	1.00 0.50	Very limited Cutbanks cave Too steep Depth to soft bedrock	1.00 1.00 0.79
2101: Radol-----	40	Very limited Depth to hard bedrock Too steep Large stones Shrink-swell Frost action	1.00 1.00 0.63 0.50 0.50	Very limited Depth to hard bedrock Too steep Large stones Cutbanks cave	1.00 1.00 0.63 0.10
Logring-----	25	Very limited Depth to hard bedrock Too steep Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Cutbanks cave	1.00 1.00 0.10
Rock outcrop-----	20	Not rated		Not rated	
2103: Radol-----	40	Very limited Depth to hard bedrock Too steep Large stones Shrink-swell Frost action	1.00 1.00 0.63 0.50 0.50	Very limited Depth to hard bedrock Too steep Large stones Cutbanks cave	1.00 1.00 0.63 0.10
Hyzen-----	30	Very limited Depth to hard bedrock Too steep Large stones Frost action	1.00 1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Large stones	1.00 1.00 1.00
Rock outcrop-----	20	Not rated		Not rated	
2111: Garnel-----	70	Very limited Too steep Depth to soft bedrock Frost action Depth to hard bedrock	1.00 1.00 1.00 0.50 0.50	Very limited Depth to hard bedrock Depth to soft bedrock Too steep Cutbanks cave	1.00 1.00 1.00 0.10
Rock outcrop-----	25	Not rated		Not rated	

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
2430: Bellenmine-----	70	Very limited Depth to hard bedrock Too steep Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Cutbanks cave	1.00 1.00 0.10
Basinpeak-----	15	Very limited Too steep Frost action Large stones	1.00 0.50 0.01	Very limited Too steep Cutbanks cave Large stones	1.00 1.00 0.01
2432: Majorsplace-----	40	Very limited Depth to hard bedrock Too steep Large stones Frost action Shrink-swell	1.00 1.00 0.70 0.50 0.22	Very limited Depth to hard bedrock Too steep Large stones Cutbanks cave	1.00 1.00 0.70 0.10
Checkett-----	30	Very limited Depth to hard bedrock Too steep Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Cutbanks cave	1.00 1.00 0.10
Grube-----	15	Very limited Too steep Large stones Frost action	1.00 1.00 0.50	Very limited Too steep Large stones Cutbanks cave	1.00 1.00 0.10
3344: Badena-----	60	Very limited Large stones Too steep Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Large stones Too steep	1.00 1.00 1.00
Badena-----	25	Very limited Large stones Too steep Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Large stones Too steep	1.00 1.00 1.00
3439: Eaglepass-----	45	Very limited Depth to hard bedrock Too steep Frost action Large stones	1.00 1.00 0.50 0.04	Very limited Depth to hard bedrock Too steep Large stones	1.00 1.00 0.04
Rock outcrop-----	25	Not rated		Not rated	
Amtoft-----	15	Very limited Depth to hard bedrock Too steep Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep	1.00 1.00
3900: Osditch-----	85	Very limited Too steep Large stones Frost action	1.00 1.00 0.50	Very limited Too steep Large stones Cutbanks cave	1.00 1.00 0.10

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4140:					
Lodar-----	35	Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00
		bedrock		bedrock	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10
Monarch-----	30	Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00
		bedrock		bedrock	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10
Highup-----	20	Very limited		Very limited	
		Too steep	1.00	Depth to hard	1.00
				bedrock	
		Depth to hard	0.84	Too steep	1.00
		bedrock			
		Frost action	0.50	Cutbanks cave	1.00
4200:					
Wardbay-----	50	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Shrink-swell	0.50	Depth to hard	0.96
				bedrock	
		Frost action	0.50	Cutbanks cave	0.10
		Large stones	0.05	Large stones	0.05
Haunchee-----	20	Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00
		bedrock		bedrock	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10
Muiral-----	15	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	1.00
				Depth to hard	0.99
				bedrock	
5100:					
Logring-----	45	Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00
		bedrock		bedrock	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10
Hyzen-----	25	Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00
		bedrock		bedrock	
		Too steep	1.00	Too steep	1.00
		Large stones	1.00	Large stones	1.00
		Frost action	0.50		
Canyoung-----	15	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	1.00
5102:					
Canyoung-----	40	Somewhat limited		Very limited	
		Frost action	0.50	Cutbanks cave	1.00
		Slope	0.16	Slope	0.16
Zarark-----	30	Somewhat limited		Very limited	
		Depth to hard	0.68	Depth to hard	1.00
		bedrock		bedrock	
		Frost action	0.50	Cutbanks cave	1.00
		Slope	0.16	Slope	0.16

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Wardbay-----	20	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Shrink-swell	0.50	Depth to hard bedrock	0.96
		Frost action	0.50	Cutbanks cave	0.10
		Large stones	0.05	Large stones	0.05
5110: Garnel-----	45	Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Depth to soft bedrock	1.00
		Frost action	0.50	Too steep	1.00
		Depth to hard bedrock	0.50	Cutbanks cave	0.10
Garnel, very steep--	30	Very limited		Very limited	
		Too steep	1.00	Depth to hard bedrock	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Frost action	0.50	Too steep	1.00
		Depth to hard bedrock	0.50	Cutbanks cave	0.10
Rock outcrop-----	15	Not rated		Not rated	
5140: Wardbay-----	45	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Shrink-swell	0.50	Depth to hard bedrock	0.96
		Frost action	0.50	Cutbanks cave	0.10
		Large stones	0.05	Large stones	0.05
Canyoung-----	25	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	1.00
Rock outcrop-----	15	Not rated		Not rated	
5160: Hyzen-----	65	Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Too steep	1.00
		Large stones	1.00	Large stones	1.00
		Frost action	0.50		
Rock outcrop-----	20	Not rated		Not rated	
5210: Badhap-----	35	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones	1.00	Large stones	1.00
		Frost action	0.50	Cutbanks cave	0.10
Badhap-----	25	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones	1.00	Large stones	1.00
		Frost action	0.50	Cutbanks cave	0.10

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Topeki-----	25	Very limited Depth to hard bedrock Too steep Large stones Frost action	1.00 1.00 0.97 0.50	Very limited Depth to hard bedrock Too steep Large stones Cutbanks cave	1.00 1.00 0.97 0.10
5220: Basinpeak-----	60	Very limited Too steep Frost action Large stones	1.00 0.50 0.01	Very limited Cutbanks cave Too steep Large stones	1.00 1.00 0.01
Badhap-----	25	Very limited Too steep Large stones Frost action	1.00 1.00 0.50	Very limited Too steep Large stones Cutbanks cave	1.00 1.00 0.10
5240: Wardbay-----	35	Very limited Too steep Shrink-swell Frost action Large stones	1.00 0.50 0.50 0.05	Very limited Too steep Depth to hard bedrock Cutbanks cave Large stones	1.00 0.96 0.10 0.05
Haunchee-----	35	Very limited Depth to hard bedrock Too steep Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Cutbanks cave	1.00 1.00 0.10
Bakerpeak-----	15	Very limited Too steep Frost action	1.00 0.50	Very limited Too steep Cutbanks cave	1.00 1.00
5241: Haunchee-----	40	Very limited Depth to hard bedrock Too steep Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Cutbanks cave	1.00 1.00 0.10
Canyoung-----	30	Very limited Too steep Frost action	1.00 0.50	Very limited Too steep Cutbanks cave	1.00 1.00
Rock outcrop-----	20	Not rated		Not rated	
5250: Bricone-----	55	Very limited Depth to hard bedrock Too steep Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Cutbanks cave	1.00 1.00 0.10
Piar-----	15	Very limited Too steep Frost action	1.00 0.50	Very limited Too steep Cutbanks cave Depth to hard bedrock	1.00 1.00 0.18
Linpeak-----	15	Very limited Too steep Frost action	1.00 0.50	Very limited Too steep Cutbanks cave	1.00 1.00

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5251:					
Bricone-----	50	Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10
Piar-----	20	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	1.00
				Depth to hard bedrock	0.18
Rock outcrop-----	15	Not rated		Not rated	
5252:					
Bricone-----	60	Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10
Rock outcrop-----	30	Not rated		Not rated	
5253:					
Windwash-----	40	Very limited		Very limited	
		Too steep	1.00	Depth to hard bedrock	1.00
		Depth to hard bedrock	0.97	Cutbanks cave	1.00
		Frost action	0.50	Too steep	1.00
Bricone-----	30	Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10
Rock outcrop-----	15	Not rated		Not rated	
5255:					
Wayhigh-----	90	Somewhat limited		Very limited	
		Frost action	0.50	Depth to hard bedrock	1.00
		Depth to hard bedrock	0.10	Cutbanks cave	1.00
		Slope	0.01	Slope	0.01
5261:					
Jonlake-----	45	Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10
Badhap-----	25	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones	1.00	Large stones	1.00
		Frost action	0.50	Cutbanks cave	0.10
Berrycreek-----	15	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Shrink-swell	0.50	Cutbanks cave	1.00
		Frost action	0.50		

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5270:					
Bakerpeak-----	40	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	1.00
Canyoung-----	35	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	1.00
Rock outcrop-----	15	Not rated		Not rated	
5290:					
Keyole-----	40	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50		
Osditch-----	25	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones	1.00	Large stones	1.00
		Frost action	0.50	Cutbanks cave	0.10
Topeki-----	20	Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Too steep	1.00	Too steep	1.00
		Large stones	0.97	Large stones	0.97
		Frost action	0.50	Cutbanks cave	0.10
5291:					
Keyole-----	50	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50		
Rubble land-----	35	Not rated		Not rated	
5292:					
Keyole-----	50	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Frost action	0.50		
Osditch-----	35	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones	1.00	Large stones	1.00
		Frost action	0.50	Cutbanks cave	0.10
5310:					
Jumble-----	55	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10
Lemcave-----	30	Very limited		Very limited	
		Too steep	1.00	Cutbanks cave	1.00
		Large stones	0.77	Too steep	1.00
				Large stones	0.77
5311:					
Jumble-----	40	Very limited		Very limited	
		Large stones	1.00	Large stones	1.00
		Too steep	1.00	Too steep	1.00
		Frost action	0.50	Cutbanks cave	0.10
Lemcave-----	30	Very limited		Very limited	
		Too steep	1.00	Cutbanks cave	1.00
		Large stones	0.77	Too steep	1.00
				Large stones	0.77

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Gaia-----	15	Very limited Too steep Large stones Frost action	 1.00 0.71 0.50	Very limited Too steep Large stones Cutbanks cave	 1.00 0.71 0.10
5320: Wardbay-----	40	Very limited Too steep Shrink-swell Frost action Large stones	 1.00 0.50 0.50 0.05	Very limited Too steep Depth to hard bedrock Cutbanks cave Large stones	 1.00 0.96 0.10 0.05
Wardbay, convex slopes-----	30	Very limited Too steep Shrink-swell Frost action Large stones	 1.00 0.50 0.50 0.05	Very limited Too steep Depth to hard bedrock Cutbanks cave Large stones	 1.00 0.96 0.10 0.05
Basinpeak-----	20	Very limited Too steep Frost action Large stones	 1.00 0.50 0.01	Very limited Too steep Cutbanks cave Large stones	 1.00 1.00 0.01
5330: Rubble land-----	35	Not rated		Not rated	
Wheelerpek-----	30	Very limited Depth to hard bedrock Too steep Large stones Frost action	 1.00 1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Large stones	 1.00 1.00 1.00
Cobblywheel-----	25	Very limited Too steep Large stones Frost action	 1.00 0.86 0.50	Very limited Too steep Large stones Cutbanks cave	 1.00 0.86 0.10
5340: Linpeak-----	50	Very limited Too steep Frost action	 1.00 0.50	Very limited Too steep Cutbanks cave	 1.00 1.00
Piar-----	20	Very limited Too steep Frost action	 1.00 0.50	Very limited Too steep Cutbanks cave Depth to hard bedrock	 1.00 1.00 0.18
Bricone-----	15	Very limited Depth to hard bedrock Too steep Frost action	 1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Cutbanks cave	 1.00 1.00 0.10

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5350: Goodski-----	35	Very limited Too steep Frost action Depth to hard bedrock Large stones	1.00 0.50 0.46 0.04	Very limited Depth to hard bedrock Cutbanks cave Too steep Depth to soft bedrock Large stones	1.00 1.00 1.00 0.64 0.04
Kious-----	35	Very limited Too steep Depth to soft bedrock Frost action	1.00 1.00 0.50	Very limited Depth to soft bedrock Too steep Cutbanks cave	1.00 1.00 0.10
Snacreek-----	15	Very limited Too steep Frost action	1.00 0.50	Very limited Cutbanks cave Too steep	1.00 1.00
5380: Ceebee-----	50	Very limited Too steep Large stones Frost action	1.00 0.98 0.50	Very limited Too steep Cutbanks cave Large stones	1.00 1.00 0.98
Strawbcrek-----	40	Very limited Too steep Frost action Large stones	1.00 0.50 0.42	Very limited Too steep Cutbanks cave Large stones	1.00 1.00 0.42
5381: Ceebee-----	50	Very limited Too steep Large stones Frost action	1.00 0.98 0.50	Very limited Too steep Cutbanks cave Large stones	1.00 1.00 0.98
Pirapeak-----	40	Very limited Too steep Large stones Frost action	1.00 1.00 0.50	Very limited Too steep Cutbanks cave Large stones	1.00 1.00 1.00
5410: Timmercrek-----	85	Very limited Too steep Frost action	1.00 0.50	Very limited Too steep Cutbanks cave	1.00 1.00
5420: Topeki-----	35	Very limited Depth to hard bedrock Too steep Large stones Frost action	1.00 1.00 0.97 0.50	Very limited Depth to hard bedrock Too steep Large stones Cutbanks cave	1.00 1.00 0.97 0.10
Badhap-----	35	Very limited Too steep Large stones Frost action	1.00 1.00 0.50	Very limited Too steep Large stones Cutbanks cave	1.00 1.00 0.10

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Jonlake-----	15	Very limited Depth to hard bedrock Too steep Frost action	1.00 1.00 0.50	Very limited Depth to hard bedrock Too steep Cutbanks cave	1.00 1.00 0.10
5425: Ripcon-----	40	Very limited Flooding Frost action	1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Flooding	1.00 0.99 0.60
Bigwash-----	30	Somewhat limited Frost action Flooding	0.50 0.40	Somewhat limited Cutbanks cave	0.10
Glideski-----	15	Very limited Large stones Shrink-swell Frost action Slope	1.00 0.50 0.50 0.04	Very limited Large stones Cutbanks cave Slope	1.00 0.10 0.04
5428: Rippo-----	45	Very limited Flooding Large stones Frost action Slope	1.00 1.00 0.50 0.01	Very limited Large stones Flooding Cutbanks cave Slope	1.00 0.60 0.10 0.01
Lehmandow-----	25	Very limited Depth to saturated zone Frost action Flooding Large stones Shrink-swell	1.00 1.00 1.00 0.83 0.50	Very limited Depth to saturated zone Large stones Flooding Cutbanks cave	1.00 0.83 0.60 0.10
Brokit-----	15	Very limited Frost action Flooding Large stones Slope	1.00 1.00 1.00 0.16	Very limited Cutbanks cave Large stones Depth to saturated zone Flooding Slope	1.00 1.00 0.97 0.60 0.16
5430: Brokit-----	85	Very limited Frost action Flooding Large stones Slope	1.00 1.00 1.00 0.63	Very limited Cutbanks cave Large stones Depth to saturated zone Slope Flooding	1.00 1.00 0.97 0.63 0.60
5432: Glideski-----	35	Very limited Large stones Shrink-swell Frost action Slope	1.00 0.50 0.50 0.04	Very limited Large stones Cutbanks cave Slope	1.00 0.10 0.04

TABLE 19.--ROADS AND STREETS AND SHALLOW EXCAVATIONS

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Brokit-----	30	Very limited		Very limited	
		Frost action	1.00	Cutbanks cave	1.00
		Flooding	1.00	Large stones	1.00
		Large stones	1.00	Depth to saturated zone	0.97
		Slope	0.04	Flooding	0.60
				Slope	0.04
Lemcave-----	20	Very limited		Very limited	
		Too steep	1.00	Too steep	1.00
		Large stones	0.77	Cutbanks cave	1.00
				Large stones	0.77
5434: Lehmandow-----	90	Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Large stones	0.83
		Flooding	1.00	Flooding	0.60
		Large stones	0.83	Cutbanks cave	0.10
		Shrink-swell	0.50		
5440: Glaciers-----	85	Not rated		Not rated	

TABLE 20.--SOURCE OF GRAVEL AND SAND

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
1650: Noski-----	35	Poor Thickest layer Bottom layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.03
Cedarcabin-----	25	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Noski-----	25	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.03
1652: Noski-----	35	Poor Thickest layer Bottom layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.03
Canyonfork-----	30	Poor Thickest layer Bottom layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.01 0.01
Cedarcabin-----	25	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
1700: Eenreed-----	40	Fair Thickest layer Bottom layer	 0.00 0.38	Fair Thickest layer Bottom layer	 0.00 0.03
Millan-----	30	Fair Thickest layer Bottom layer	 0.12 0.12	Fair Thickest layer Bottom layer	 0.00 0.03
Eenreed-----	15	Fair Thickest layer Bottom layer	 0.00 0.38	Fair Thickest layer Bottom layer	 0.00 0.03
1900: Borvant-----	90	Fair Thickest layer Bottom layer	 0.00 0.56	Fair Thickest layer Bottom layer	 0.00 0.10
2000: Closkey-----	85	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
2101: Radol-----	40	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Logring-----	25	Fair Thickest layer Bottom layer	 0.00 0.12	Poor Thickest layer Bottom layer	 0.00 0.00
Rock outcrop-----	20	Not rated		Not rated	

TABLE 20.--SOURCE OF GRAVEL AND SAND

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
2103: Radol-----	40	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Hyzen-----	30	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	20	Not rated		Not rated	
2111: Garnel-----	70	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	25	Not rated		Not rated	
2430: Bellenmine-----	70	Fair Thickest layer Bottom layer	 0.04 0.12	Poor Bottom layer Thickest layer	 0.00 0.00
Basinpeak-----	15	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
2432: Majorsplace-----	40	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Thickest layer Bottom layer	 0.00 0.00
Checkett-----	30	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Thickest layer Bottom layer	 0.00 0.00
Grube-----	15	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
3344: Badena-----	60	Fair Bottom layer Thickest layer	 0.11 0.11	Fair Thickest layer Bottom layer	 0.00 0.11
Badena-----	25	Fair Thickest layer Bottom layer	 0.11 0.11	Fair Thickest layer Bottom layer	 0.00 0.11
3439: Eaglepass-----	45	Fair Thickest layer Bottom layer	 0.00 0.50	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	25	Not rated		Not rated	
Amtoft-----	15	Fair Thickest layer Bottom layer	 0.00 0.25	Poor Bottom layer Thickest layer	 0.00 0.00
3900: Osditch-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.03

TABLE 20.--SOURCE OF GRAVEL AND SAND

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
4140: Lodar-----	35	Fair Thickest layer Bottom layer	 0.00 0.69	Poor Bottom layer Thickest layer	 0.00 0.00
Monarch-----	30	Fair Thickest layer Bottom layer	 0.00 0.12	Poor Bottom layer Thickest layer	 0.00 0.00
Highup-----	20	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
4200: Wardbay-----	50	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Haunchee-----	20	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Muiral-----	15	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
5100: Logring-----	45	Fair Thickest layer Bottom layer	 0.00 0.12	Poor Bottom layer Thickest layer	 0.00 0.00
Hyzen-----	25	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Canyoung-----	15	Fair Bottom layer Thickest layer	 0.50 0.50	Poor Bottom layer Thickest layer	 0.00 0.00
5102: Canyoung-----	40	Fair Bottom layer Thickest layer	 0.50 0.50	Poor Thickest layer Bottom layer	 0.00 0.00
Zarark-----	30	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.01 0.03
Wardbay-----	20	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
5110: Garnel-----	45	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Garnel, very steep--	30	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	15	Not rated		Not rated	
5140: Wardbay-----	45	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00

TABLE 20.--SOURCE OF GRAVEL AND SAND

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Canyoung-----	25	Fair Thickest layer Bottom layer	 0.50 0.50	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	15	Not rated		Not rated	
5160: Hyzen-----	65	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	20	Not rated		Not rated	
5210: Badhap-----	35	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Badhap-----	25	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Topeki-----	25	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
5220: Basinpeak-----	60	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Badhap-----	25	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
5240: Wardbay-----	35	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Haunchee-----	35	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Thickest layer Bottom layer	 0.00 0.00
Bakerpeak-----	15	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Thickest layer Bottom layer	 0.00 0.00
5241: Haunchee-----	40	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Canyoung-----	30	Fair Thickest layer Bottom layer	 0.50 0.50	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	20	Not rated		Not rated	
5250: Bricone-----	55	Poor Thickest layer Bottom layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.01
Piar-----	15	Fair Thickest layer Bottom layer	 0.38 0.38	Poor Thickest layer Bottom layer	 0.00 0.00

TABLE 20.--SOURCE OF GRAVEL AND SAND

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Linpeak-----	15	Fair Thickest layer Bottom layer	 0.00 0.56	Poor Bottom layer Thickest layer	 0.00 0.00
5251: Bricone-----	50	Poor Thickest layer Bottom layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.01
Piar-----	20	Fair Thickest layer Bottom layer	 0.38 0.38	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	15	Not rated		Not rated	
5252: Bricone-----	60	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.01
Rock outcrop-----	30	Not rated		Not rated	
5253: Windwash-----	40	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Bricone-----	30	Poor Thickest layer Bottom layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.01
Rock outcrop-----	15	Not rated		Not rated	
5255: Wayhigh-----	90	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.01 0.01
5261: Jonlake-----	45	Fair Thickest layer Bottom layer	 0.09 0.12	Poor Bottom layer Thickest layer	 0.00 0.00
Badhap-----	25	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Berrycreek-----	15	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Thickest layer Bottom layer	 0.00 0.00
5270: Bakerpeak-----	40	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Canyoung-----	35	Fair Bottom layer Thickest layer	 0.50 0.50	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	15	Not rated		Not rated	
5290: Keyole-----	40	Fair Thickest layer Bottom layer	 0.25 0.57	Fair Bottom layer Thickest layer	 0.04 0.04

TABLE 20.--SOURCE OF GRAVEL AND SAND

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Osditch-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.03
Topeki-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Poor Thickest layer Bottom layer	0.00 0.00
5291: Keyole-----	50	Fair Thickest layer Bottom layer	0.25 0.57	Fair Bottom layer Thickest layer	0.04 0.04
Rubble land-----	35	Not rated		Not rated	
5292: Keyole-----	50	Fair Thickest layer Bottom layer	0.25 0.57	Fair Bottom layer Thickest layer	0.04 0.04
Osditch-----	35	Poor Thickest layer Bottom layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.03
5310: Jumble-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Lemcave-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Thickest layer Bottom layer	0.00 0.00
5311: Jumble-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Lemcave-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Thickest layer Bottom layer	0.00 0.00
Gaia-----	15	Poor Thickest layer Bottom layer	0.00 0.00	Poor Thickest layer Bottom layer	0.00 0.00
5320: Wardbay-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Wardbay, convex slopes-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Thickest layer Bottom layer	0.00 0.00
Basinpeak-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
5330: Rubble land-----	35	Not rated		Not rated	
Wheelerpek-----	30	Poor Thickest layer Bottom layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

TABLE 20.--SOURCE OF GRAVEL AND SAND

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Cobblywheel-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
5340: Linpeak-----	50	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.56	Thickest layer	0.00
Piar-----	20	Fair		Poor	
		Bottom layer	0.38	Bottom layer	0.00
		Thickest layer	0.38	Thickest layer	0.00
Bricone-----	15	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.01
5350: Goodski-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.05
Kious-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05
Snacreek-----	15	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.05
		Thickest layer	0.00	Thickest layer	0.05
5380: Ceebee-----	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.11
		Thickest layer	0.00	Thickest layer	0.13
Strawbcrek-----	40	Poor		Poor	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
5381: Ceebee-----	50	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.11
		Bottom layer	0.00	Thickest layer	0.13
Pirapeak-----	40	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.05
		Bottom layer	0.00	Bottom layer	0.06
5410: Timmercrek-----	85	Fair		Fair	
		Thickest layer	0.25	Bottom layer	0.03
		Bottom layer	0.38	Thickest layer	0.03
5420: Topeki-----	35	Poor		Poor	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
Badhap-----	35	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Jonlake-----	15	Fair		Poor	
		Thickest layer	0.09	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00

TABLE 20.--SOURCE OF GRAVEL AND SAND

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
5425: Ripcon-----	40	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Thickest layer Bottom layer	 0.00 0.03
Bigwash-----	30	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Glideski-----	15	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
5428: Rippo-----	45	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Lehmandow-----	25	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Brokit-----	15	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Thickest layer Bottom layer	 0.00 0.00
5430: Brokit-----	85	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Thickest layer Bottom layer	 0.00 0.00
5432: Glideski-----	35	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Brokit-----	30	Poor Thickest layer Bottom layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Lemcave-----	20	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Thickest layer Bottom layer	 0.00 0.00
5434: Lehmandow-----	90	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
5440: Glaciers-----	85	Not rated		Not rated	

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1650: Noski-----	35	Poor Droughty Carbonate content Depth to bedrock Too alkaline Organic matter content low	0.00 0.00 0.00 0.00 0.00 0.92	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock Carbonate content	0.00 0.00 0.00 0.06
Cedarcabin-----	25	Poor Droughty Carbonate content Depth to bedrock Organic matter content low	0.00 0.00 0.65 0.92	Poor Depth to bedrock Slope Shrink-swell Cobble content	0.00 0.00 0.94 0.99	Poor Slope Rock fragments Carbonate content Depth to bedrock	0.00 0.00 0.00 0.65
Noski-----	25	Poor Droughty Carbonate content Depth to bedrock Too alkaline Organic matter content low	0.00 0.00 0.00 0.00 0.00 0.92	Poor Depth to bedrock Slope	0.00 0.82	Poor Rock fragments Depth to bedrock Slope Carbonate content	0.00 0.00 0.00 0.06
1652: Noski-----	35	Poor Droughty Carbonate content Depth to bedrock Too alkaline Organic matter content low	0.00 0.00 0.00 0.00 0.00 0.92	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock Carbonate content	0.00 0.00 0.00 0.06
Canyonfork-----	30	Fair Carbonate content Droughty Organic matter content low	0.08 0.17 0.92	Good		Poor Hard to reclaim (rock fragments) Rock fragments Carbonate content	0.00 0.00 0.20
Cedarcabin-----	25	Poor Carbonate content Droughty Depth to bedrock Organic matter content low	0.00 0.00 0.65 0.92	Poor Depth to bedrock Slope Shrink-swell Cobble content	0.00 0.18 0.94 0.99	Poor Slope Rock fragments Carbonate content Depth to bedrock	0.00 0.00 0.00 0.65
1700: Eenreed-----	40	Fair Droughty Organic matter content low	0.17 0.75	Good		Poor Hard to reclaim (rock fragments) Rock fragments Slope	0.00 0.00 0.84
Millan-----	30	Fair Droughty Organic matter content low	0.55 0.75	Poor Slope	0.00	Poor Hard to reclaim (rock fragments) Rock fragments Slope	0.00 0.00 0.00

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Eenreed-----	15	Fair Droughty Organic matter content low	0.17 0.75	Poor Slope	0.00	Poor Slope Hard to reclaim (rock fragments) Rock fragments	0.00 0.00 0.00
1900: Borvant-----	90	Poor Droughty Carbonate content Depth to cemented pan	0.00 0.00 0.00	Poor Depth to cemented pan Slope	0.00 0.92	Poor Rock fragments Depth to cemented pan Slope Carbonate content	0.00 0.00 0.00 0.69
2000: Closkey-----	85	Poor Droughty Depth to bedrock Organic matter content low	0.00 0.21 0.75	Poor Depth to bedrock Slope	0.00 0.92	Poor Rock fragments Slope Depth to bedrock	0.00 0.00 0.21
2101: Radol-----	40	Poor Droughty Depth to bedrock Carbonate content Cobble content	0.00 0.00 0.32 0.44	Poor Depth to bedrock Slope Cobble content Shrink-swell	0.00 0.00 0.67 0.87	Poor Slope Rock fragments Depth to bedrock Carbonate content	0.00 0.00 0.00 0.46
Logring-----	25	Poor Droughty Depth to bedrock Carbonate content Organic matter content low	0.00 0.00 0.80 0.88	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock Carbonate content	0.00 0.00 0.00 0.80
Rock outcrop-----	20	Not rated		Not rated		Not rated	
2103: Radol-----	40	Poor Droughty Depth to bedrock Carbonate content Cobble content	0.00 0.00 0.32 0.44	Poor Depth to bedrock Slope Cobble content Shrink-swell	0.00 0.00 0.67 0.87	Poor Slope Rock fragments Depth to bedrock Carbonate content	0.00 0.00 0.00 0.46
Hyzen-----	30	Poor Stone content Droughty Depth to bedrock Carbonate content Cobble content	0.00 0.00 0.00 0.00 0.80	Poor Depth to bedrock Stones Slope Cobble content	0.00 0.00 0.00 0.53	Poor Carbonate content Depth to bedrock Rock fragments Slope	0.00 0.00 0.00 0.00
Rock outcrop-----	20	Not rated		Not rated		Not rated	
2111: Garnel-----	70	Poor Droughty Depth to bedrock Stone content	0.00 0.00 0.82	Poor Depth to bedrock Slope	0.00 0.00	Poor Rock fragments Depth to bedrock Slope	0.00 0.00 0.00
Rock outcrop-----	25	Not rated		Not rated		Not rated	

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2430: Bellenmine-----	70	Poor Droughty Depth to bedrock Organic matter content low Stone content Too clayey	0.00 0.00 0.12 0.84 0.98	Poor Depth to bedrock Slope	0.00 0.50	Poor Rock fragments Slope Depth to bedrock Too clayey	0.00 0.00 0.00 0.57
Basinpeak-----	15	Fair Droughty Organic matter content low Stone content	0.49 0.75 0.93	Poor Slope Stones Cobble content	0.00 0.84 0.94	Poor Slope Hard to reclaim (rock fragments) Rock fragments	0.00 0.00 0.00
2432: Majorsplace-----	40	Poor Droughty Depth to bedrock Too alkaline Cobble content Carbonate content	0.00 0.00 0.00 0.35 0.80	Poor Depth to bedrock Cobble content Slope Shrink-swell	0.00 0.44 0.50 0.89	Poor Rock fragments Depth to bedrock Slope	0.00 0.00 0.00
Checkett-----	30	Poor Droughty Depth to bedrock Too alkaline Organic matter content low Too clayey	0.00 0.00 0.00 0.88 0.98	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Depth to bedrock Rock fragments Too clayey	0.00 0.00 0.00 0.70
Grube-----	15	Fair Cobble content Organic matter content low Droughty Carbonate content Too clayey Stone content	0.07 0.12 0.35 0.80 0.95 0.97	Poor Slope Cobble content Stones	0.00 0.00 0.92	Poor Slope Hard to reclaim (rock fragments) Rock fragments Too clayey	0.00 0.00 0.00 0.69
3344: Badena-----	60	Poor Stone content Droughty Organic matter content low Cobble content	0.00 0.01 0.75 0.92	Poor Stones Cobble content	0.00 0.13	Poor Hard to reclaim (rock fragments) Rock fragments Slope	0.00 0.00 0.00
Badena-----	25	Poor Stone content Droughty Organic matter content low Cobble content	0.00 0.01 0.75 0.89	Poor Stones Cobble content Slope	0.00 0.06 0.68	Poor Rock fragments Slope Hard to reclaim (rock fragments)	0.00 0.00 0.00
3439: Eaglepass-----	45	Poor Droughty Depth to bedrock Stone content Organic matter content low Carbonate content	0.00 0.00 0.06 0.50 0.80	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock Carbonate content	0.00 0.00 0.00 0.80
Rock outcrop-----	25	Not rated		Not rated		Not rated	

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Amtoft-----	15	Poor Droughty Depth to bedrock Carbonate content	0.00 0.00 0.08	Poor Depth to bedrock Slope	0.00 0.98	Poor Rock fragments Depth to bedrock Slope Carbonate content	0.00 0.00 0.00 0.68
3900: Osditch-----	85	Poor Stone content Droughty Organic matter content low Cobble content Too acid	0.00 0.50 0.75 0.97 0.99	Poor Stones Slope Cobble content	0.00 0.00 0.16	Poor Hard to reclaim (rock fragments) Slope Rock fragments	0.00 0.00 0.00
4140: Lodar-----	35	Poor Droughty Carbonate content Depth to bedrock Organic matter content low	0.00 0.00 0.00 0.12	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock Carbonate content	0.00 0.00 0.00 0.00
Monarch-----	30	Poor Droughty Depth to bedrock Carbonate content	0.00 0.00 0.46	Poor Slope Depth to bedrock	0.00 0.00	Poor Slope Rock fragments Depth to bedrock Carbonate content	0.00 0.00 0.00 0.86
Highup-----	20	Poor Droughty Depth to bedrock Carbonate content	0.00 0.16 0.32	Poor Slope Depth to bedrock	0.00 0.00	Poor Slope Rock fragments Depth to bedrock Carbonate content	0.00 0.00 0.16 0.46
4200: Wardbay-----	50	Fair Carbonate content Droughty Cobble content	0.16 0.44 0.92	Poor Slope Depth to bedrock Cobble content Shrink-swell	0.00 0.04 0.19 0.87	Poor Rock fragments Slope Hard to reclaim (rock fragments) Carbonate content	0.00 0.00 0.00 0.16
Haunchee-----	20	Poor Droughty Carbonate content Depth to bedrock Stone content Sodium content	0.00 0.00 0.00 0.69 0.78	Poor Depth to bedrock Slope Stones	0.00 0.00 0.99	Poor Slope Rock fragments Depth to bedrock Carbonate content Sodium content	0.00 0.00 0.00 0.09 0.78
Muiral-----	15	Fair Organic matter content low Droughty Too acid	0.50 0.80 0.99	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments	0.00 0.00
5100: Logring-----	45	Poor Depth to bedrock Droughty Carbonate content Organic matter content low	0.00 0.00 0.80 0.88	Poor Depth to bedrock Slope	0.00 0.00	Poor Depth to bedrock Rock fragments Slope Carbonate content	0.00 0.00 0.00 0.80

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hyzen-----	25	Poor Carbonate content Stone content Droughty Depth to bedrock Cobble content	0.00 0.00 0.00 0.00 0.80	Poor Stones Depth to bedrock Slope Cobble content	0.00 0.00 0.00 0.00 0.53	Poor Slope Rock fragments Depth to bedrock Carbonate content	0.00 0.00 0.00 0.00 0.00
Canyoung-----	15	Poor Droughty Organic matter content low Carbonate content	0.00 0.88 0.92	Poor Slope	0.00	Poor Slope Hard to reclaim (rock fragments) Rock fragments Carbonate content	0.00 0.00 0.00 0.99
5102: Canyoung-----	40	Poor Droughty Organic matter content low Carbonate content	0.00 0.88 0.92	Good		Poor Hard to reclaim (rock fragments) Rock fragments Slope Carbonate content	0.00 0.00 0.84 0.99
Zarark-----	30	Poor Droughty Carbonate content Depth to bedrock	0.00 0.00 0.32	Poor Depth to bedrock	0.00	Poor Rock fragments Depth to bedrock Carbonate content Slope	0.00 0.32 0.62 0.84
Wardbay-----	20	Fair Carbonate content Droughty Cobble content	0.16 0.44 0.92	Fair Depth to bedrock Slope Cobble content Shrink-swell	0.04 0.08 0.19 0.87	Poor Slope Hard to reclaim (rock fragments) Rock fragments Carbonate content	0.00 0.00 0.00 0.00 0.16
5110: Garnel-----	45	Poor Droughty Depth to bedrock Stone content	0.00 0.00 0.82	Poor Depth to bedrock Slope	0.00 0.50	Poor Rock fragments Depth to bedrock Slope	0.00 0.00 0.00
Garnel, very steep--	30	Poor Droughty Depth to bedrock Stone content	0.00 0.00 0.82	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock	0.00 0.00 0.00 0.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
5140: Wardbay-----	45	Fair Carbonate content Droughty Cobble content	0.16 0.44 0.92	Fair Depth to bedrock Cobble content Slope Shrink-swell	0.04 0.19 0.50 0.87	Poor Hard to reclaim (rock fragments) Rock fragments Slope Carbonate content	0.00 0.00 0.00 0.00 0.16
Canyoung-----	25	Poor Droughty Organic matter content low Carbonate content	0.00 0.88 0.92	Poor Slope	0.00	Poor Slope Hard to reclaim (rock fragments) Rock fragments Carbonate content	0.00 0.00 0.00 0.99

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Rock outcrop-----	15	Not rated		Not rated		Not rated	
5160: Hyzen-----	65	Poor		Poor		Poor	
		Depth to bedrock	0.00	Depth to bedrock	0.00	Slope	0.00
		Carbonate content	0.00	Slope	0.00	Rock fragments	0.00
		Droughty	0.00	Stones	0.00	Depth to bedrock	0.00
		Stone content	0.00	Cobble content	0.53	Carbonate content	0.00
		Cobble content	0.80				
Rock outcrop-----	20	Not rated		Not rated		Not rated	
5210: Badhap-----	35	Poor		Poor		Poor	
		Cobble content	0.00	Slope	0.00	Rock fragments	0.00
		Stone content	0.74	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Droughty	0.94	Stones	0.69	Slope	0.00
Badhap-----	25	Poor		Poor		Poor	
		Cobble content	0.00	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Stone content	0.87	Slope	0.00	Slope	0.00
		Droughty	0.94	Stones	0.89	Rock fragments	0.00
Topeki-----	25	Poor		Poor		Poor	
		Stone content	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Stones	0.00	Depth to bedrock	0.00
		Droughty	0.00	Slope	0.68	Slope	0.00
		Too acid	0.95				
5220: Basinpeak-----	60	Fair		Poor		Poor	
		Droughty	0.49	Slope	0.00	Hard to reclaim (rock fragments)	0.00
		Organic matter content low	0.75	Stones	0.84	Rock fragments	0.00
		Stone content	0.93	Cobble content	0.94	Slope	0.00
Badhap-----	25	Poor		Poor		Poor	
		Cobble content	0.00	Cobble content	0.00	Slope	0.00
		Stone content	0.87	Slope	0.00	Rock fragments	0.00
		Droughty	0.94	Stones	0.89	Hard to reclaim (rock fragments)	0.00
5240: Wardbay-----	35	Fair		Poor		Poor	
		Carbonate content	0.16	Slope	0.00	Hard to reclaim (rock fragments)	0.00
		Droughty	0.44	Depth to bedrock	0.04	Rock fragments	0.00
		Cobble content	0.92	Cobble content	0.19	Slope	0.00
				Shrink-swell	0.87	Carbonate content	0.16
Haunchee-----	35	Poor		Poor		Poor	
		Carbonate content	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Droughty	0.00	Stones	0.99	Rock fragments	0.00
		Stone content	0.69			Carbonate content	0.09
		Sodium content	0.78			Sodium content	0.78
Bakerpeak-----	15	Fair		Poor		Poor	
		Carbonate content	0.32	Slope	0.00	Rock fragments	0.00
		Droughty	0.33	Cobble content	0.99	Slope	0.00
		Organic matter content low	0.75			Hard to reclaim (rock fragments)	0.00
		Too acid	0.99			Carbonate content	0.72

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5241: Haunchee-----	40	Poor Droughty Depth to bedrock Carbonate content Stone content Sodium content	0.00 0.00 0.00 0.69 0.78	Poor Slope Depth to bedrock Stones	0.00 0.00 0.00 0.99	Poor Slope Depth to bedrock Rock fragments Carbonate content Sodium content	0.00 0.00 0.00 0.09 0.78
Canyoung-----	30	Poor Droughty Organic matter content low Carbonate content	0.00 0.88 0.92	Poor Slope	0.00	Poor Slope Hard to reclaim (rock fragments) Rock fragments Carbonate content	0.00 0.00 0.00 0.99
Rock outcrop-----	20	Not rated		Not rated		Not rated	
5250: Bricone-----	55	Poor Droughty Depth to bedrock Organic matter content low	0.00 0.00 0.75	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock	0.00 0.00 0.00
Piar-----	15	Fair Droughty Carbonate content Organic matter content low Too acid	0.01 0.32 0.75 0.99	Poor Slope Depth to bedrock	0.00 0.82	Poor Slope Hard to reclaim (rock fragments) Rock fragments Carbonate content	0.00 0.00 0.00 0.58
Linpeak-----	15	Fair Carbonate content Organic matter content low Too acid Droughty	0.16 0.32 0.84 0.91	Poor Slope	0.00	Poor Slope Rock fragments Hard to reclaim (rock fragments) Carbonate content	0.00 0.00 0.00 0.95
5251: Bricone-----	50	Poor Droughty Depth to bedrock Organic matter content low	0.00 0.00 0.75	Poor Depth to bedrock Slope	0.00 0.00	Poor Rock fragments Slope Depth to bedrock	0.00 0.00 0.00
Piar-----	20	Fair Droughty Carbonate content Organic matter content low Too acid	0.01 0.32 0.75 0.99	Poor Slope Depth to bedrock	0.00 0.82	Poor Slope Hard to reclaim (rock fragments) Rock fragments Carbonate content	0.00 0.00 0.00 0.58
Rock outcrop-----	15	Not rated		Not rated		Not rated	
5252: Bricone-----	60	Poor Droughty Depth to bedrock Organic matter content low	0.00 0.00 0.75	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock	0.00 0.00 0.00
Rock outcrop-----	30	Not rated		Not rated		Not rated	

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5253: Windwash-----	40	Poor Droughty Carbonate content Depth to bedrock Organic matter content low	0.00 0.00 0.03 0.18	Poor Depth to bedrock Slope	0.00 0.00	Poor Carbonate content Rock fragments Slope Depth to bedrock	0.00 0.00 0.00 0.03
Bricone-----	30	Poor Droughty Depth to bedrock Organic matter content low	0.00 0.00 0.75	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock	0.00 0.00 0.00
Rock outcrop-----	15	Not rated		Not rated		Not rated	
5255: Wayhigh-----	90	Poor Droughty Organic matter content low Depth to bedrock	0.00 0.50 0.90	Poor Depth to bedrock Cobble content	0.00 0.86	Poor Rock fragments Depth to bedrock	0.00 0.90
5261: Jonlake-----	45	Poor Droughty Depth to bedrock	0.00 0.00	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock	0.00 0.00 0.00
Badhap-----	25	Poor Cobble content Stone content Droughty	0.00 0.74 0.94	Poor Cobble content Slope Stones	0.00 0.00 0.69	Poor Slope Rock fragments Hard to reclaim (rock fragments)	0.00 0.00 0.00
Berrycreek-----	15	Fair Organic matter content low Droughty	0.88 0.95	Poor Slope Shrink-swell	0.00 0.87	Poor Rock fragments Slope Hard to reclaim (rock fragments)	0.00 0.00 0.00
5270: Bakerpeak-----	40	Fair Carbonate content Droughty Organic matter content low Too acid	0.32 0.33 0.75 0.99	Poor Slope Cobble content	0.00 0.99	Poor Rock fragments Hard to reclaim (rock fragments) Slope Carbonate content	0.00 0.00 0.00 0.72
Canyoung-----	35	Poor Droughty Organic matter content low Carbonate content	0.00 0.88 0.92	Poor Slope	0.00	Poor Slope Hard to reclaim (rock fragments) Rock fragments Carbonate content	0.00 0.00 0.00 0.99
Rock outcrop-----	15	Not rated		Not rated		Not rated	
5290: Keyole-----	40	Poor Droughty Organic matter content low Stone content	0.00 0.12 0.99	Poor Slope Stones Cobble content	0.00 0.93 0.99	Poor Rock fragments Slope Hard to reclaim (rock fragments)	0.00 0.00 0.00

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Osditch-----	25	Poor Stone content	0.00	Poor Slope	0.00	Poor Hard to reclaim (rock fragments)	0.00
		Droughty	0.50	Stones	0.00	Rock fragments	0.00
		Organic matter content low	0.75	Cobble content	0.16	Slope	0.00
		Cobble content	0.97				
		Too acid	0.99				
Topeki-----	20	Poor Droughty	0.00	Poor Depth to bedrock	0.00	Poor Slope	0.00
		Depth to bedrock	0.00	Stones	0.00	Rock fragments	0.00
		Stone content	0.00	Slope	0.00	Depth to bedrock	0.00
		Too acid	0.95				
5291: Keyole-----	50	Poor Droughty	0.00	Poor Slope	0.00	Poor Rock fragments	0.00
		Organic matter content low	0.12	Stones	0.93	Slope	0.00
		Stone content	0.99	Cobble content	0.99	Hard to reclaim (rock fragments)	0.00
Rubble land-----	35	Not rated		Not rated		Not rated	
5292: Keyole-----	50	Poor Droughty	0.00	Poor Slope	0.00	Poor Rock fragments	0.00
		Organic matter content low	0.12	Stones	0.93	Slope	0.00
		Stone content	0.99	Cobble content	0.99	Hard to reclaim (rock fragments)	0.00
Osditch-----	35	Poor Stone content	0.00	Poor Slope	0.00	Poor Slope	0.00
		Droughty	0.50	Stones	0.00	Rock fragments	0.00
		Organic matter content low	0.75	Cobble content	0.16	Hard to reclaim (rock fragments)	0.00
		Cobble content	0.97				
		Too acid	0.99				
5310: Jumble-----	55	Poor Stone content	0.00	Poor Stones	0.00	Poor Hard to reclaim (rock fragments)	0.00
		Cobble content	0.00	Cobble content	0.00	Rock fragments	0.00
		Organic matter content low	0.32	Slope	0.00	Slope	0.00
		Too acid	0.95				
		Droughty	0.96				
Lemcave-----	30	Fair Droughty	0.08	Poor Slope	0.00	Poor Hard to reclaim (rock fragments)	0.00
		Too sandy	0.16	Cobble content	0.04	Rock fragments	0.00
		Organic matter content low	0.32	Stones	0.62	Slope	0.00
		Stone content	0.58			Too sandy	0.16
		Cobble content	0.79				
		Too acid	0.84				

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5311: Jumble-----	40	Poor Stone content Cobble content Organic matter content low Too acid Droughty	0.00 0.00 0.32 0.95 0.96	Poor Stones Cobble content Slope	0.00 0.00 0.00	Poor Hard to reclaim (rock fragments) Rock fragments Slope	0.00 0.00 0.00
Lemcave-----	30	Fair Droughty Too sandy Organic matter content low Stone content Cobble content Too acid	0.08 0.16 0.32 0.58 0.79 0.84	Poor Slope Cobble content Stones	0.00 0.04 0.62	Poor Hard to reclaim (rock fragments) Rock fragments Slope Too sandy	0.00 0.00 0.00 0.16
Gaia-----	15	Fair Droughty Cobble content Organic matter content low	0.17 0.42 0.75	Poor Cobble content Slope Stones	0.00 0.00 0.99	Poor Slope Hard to reclaim (rock fragments) Rock fragments	0.00 0.00 0.00
5320: Wardbay-----	40	Fair Carbonate content Droughty Cobble content	0.16 0.44 0.92	Poor Slope Depth to bedrock Cobble content Shrink-swell	0.00 0.04 0.19 0.87	Poor Rock fragments Hard to reclaim (rock fragments) Slope Carbonate content	0.00 0.00 0.00 0.16
Wardbay, convex slopes-----	30	Fair Carbonate content Droughty Cobble content	0.16 0.44 0.92	Poor Slope Depth to bedrock Cobble content Shrink-swell	0.00 0.04 0.19 0.87	Poor Slope Hard to reclaim (rock fragments) Rock fragments Carbonate content	0.00 0.00 0.00 0.16
Basinpeak-----	20	Fair Droughty Organic matter content low Stone content	0.49 0.75 0.93	Poor Slope Stones Cobble content	0.00 0.84 0.94	Poor Slope Hard to reclaim (rock fragments) Rock fragments	0.00 0.00 0.00
5330: Rubble land-----	35	Not rated		Not rated		Not rated	
Wheelerpek-----	30	Poor Droughty Depth to bedrock Stone content Cobble content Organic matter content low Too acid	0.00 0.00 0.00 0.27 0.75 0.95	Poor Depth to bedrock Slope Cobble content Stones	0.00 0.00 0.07 0.08	Poor Slope Rock fragments Depth to bedrock	0.00 0.00 0.00
Cobblywheel-----	25	Fair Cobble content Droughty Organic matter content low	0.08 0.40 0.75	Poor Cobble content Slope	0.00 0.00	Poor Rock fragments Slope Hard to reclaim (rock fragments)	0.00 0.00 0.00

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5340: Linpeak-----	50	Fair Carbonate content Organic matter content low Too acid Droughty	0.16 0.32 0.84 0.91	Poor Slope	0.00	Poor Slope Hard to reclaim (rock fragments) Rock fragments Carbonate content	0.00 0.00 0.00 0.95
Piar-----	20	Fair Droughty Carbonate content Organic matter content low Too acid	0.01 0.32 0.75 0.99	Poor Slope Depth to bedrock	0.00 0.82	Poor Slope Hard to reclaim (rock fragments) Rock fragments Carbonate content	0.00 0.00 0.00 0.58
Bricone-----	15	Poor Droughty Depth to bedrock Organic matter content low	0.00 0.00 0.75	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock	0.00 0.00 0.00
5350: Goodski-----	35	Poor Droughty Depth to bedrock Cobble content	0.00 0.35 0.96	Poor Depth to bedrock Slope Cobble content	0.00 0.00 0.87	Poor Rock fragments Slope Depth to bedrock	0.00 0.00 0.35
Kious-----	35	Poor Droughty Depth to bedrock	0.00 0.00	Poor Depth to bedrock Slope	0.00 0.00	Poor Slope Rock fragments Depth to bedrock	0.00 0.00 0.00
Snacreek-----	15	Fair Droughty Too acid	0.06 0.74	Poor Slope	0.00	Poor Hard to reclaim (rock fragments) Rock fragments Slope	0.00 0.00 0.00
5380: Ceebee-----	50	Poor Stone content Organic matter content low Too sandy Too acid	0.00 0.08 0.16 0.54	Poor Stones Slope Cobble content	0.00 0.00 0.76	Poor Slope Hard to reclaim (rock fragments) Rock fragments Too sandy Too acid	0.00 0.00 0.00 0.16 0.98
Strawbcrek-----	40	Fair Organic matter content low Too acid Stone content Droughty Cobble content	0.32 0.54 0.65 0.78 0.82	Poor Slope Cobble content Stones	0.00 0.36 0.52	Poor Slope Hard to reclaim (rock fragments) Rock fragments	0.00 0.00 0.00
5381: Ceebee-----	50	Poor Stone content Organic matter content low Too sandy Too acid	0.00 0.08 0.16 0.54	Poor Slope Stones Cobble content	0.00 0.00 0.76	Poor Slope Hard to reclaim (rock fragments) Rock fragments Too sandy Too acid	0.00 0.00 0.00 0.16 0.98

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Pirapeak-----	40	Poor Stone content Droughty Too sandy Organic matter content low Cobble content	 0.00 0.00 0.04 0.32 0.86	Poor Slope Stones Cobble content	 0.00 0.00 0.08	Poor Slope Hard to reclaim (rock fragments) Rock fragments Too sandy	 0.00 0.00 0.00 0.04
5410: Timmercrek-----	85	Fair Droughty Stone content Organic matter content low Too acid	 0.47 0.49 0.75 0.95	Poor Slope Stones	 0.00 0.30	Poor Slope Hard to reclaim (rock fragments) Rock fragments	 0.00 0.00 0.00
5420: Topeki-----	35	Poor Droughty Depth to bedrock Stone content Too acid	 0.00 0.00 0.00 0.95	Poor Slope Stones Depth to bedrock	 0.00 0.00 0.00	Poor Rock fragments Depth to bedrock Slope	 0.00 0.00 0.00
Badhap-----	35	Poor Cobble content Stone content Droughty	 0.00 0.74 0.94	Poor Cobble content Slope Stones	 0.00 0.00 0.69	Poor Slope Rock fragments Hard to reclaim (rock fragments)	 0.00 0.00 0.00
Jonlake-----	15	Poor Droughty Depth to bedrock	 0.00 0.00	Poor Depth to bedrock Slope	 0.00 0.50	Poor Rock fragments Depth to bedrock Slope	 0.00 0.00 0.00
5425: Ripcon-----	40	Poor Too alkaline Droughty	 0.00 0.18	Fair Wetness depth	 0.98	Poor Hard to reclaim (rock fragments) Rock fragments Wetness depth	 0.00 0.00 0.98
Bigwash-----	30	Good		Good		Fair Rock fragments	 0.88
Glideski-----	15	Poor Stone content Droughty Cobble content	 0.00 0.47 0.71	Poor Stones Cobble content Shrink-swell	 0.00 0.00 0.99	Poor Rock fragments Hard to reclaim (rock fragments) Slope	 0.00 0.00 0.96
5428: Rippo-----	45	Poor Stone content Cobble content Too acid	 0.00 0.12 0.99	Poor Cobble content Stones	 0.00 0.00	Poor Hard to reclaim (rock fragments) Rock fragments	 0.00 0.00
Lehmandow-----	25	Poor Stone content Organic matter content low	 0.00 0.92	Poor Wetness depth Stones Shrink-swell	 0.00 0.00 0.87	Poor Wetness depth Rock fragments Hard to reclaim (rock fragments)	 0.00 0.00 0.41

TABLE 21.--SOURCE OF RECLAMATION MATERIAL, ROADFILL, AND TOPSOIL

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Brokit-----	15	Poor Stone content Droughty Too sandy Cobble content Organic matter content low	 0.00 0.04 0.04 0.17 0.75	Poor Cobble content Stones Wetness depth	 0.00 0.00 0.99	Poor Rock fragments Hard to reclaim (rock fragments) Too sandy Slope Wetness depth	 0.00 0.00 0.04 0.84 0.99
5430: Brokit-----	85	Poor Stone content Droughty Too sandy Cobble content Organic matter content low	 0.00 0.04 0.04 0.17 0.75	Poor Stones Cobble content Wetness depth	 0.00 0.00 0.99	Poor Hard to reclaim (rock fragments) Rock fragments Too sandy Slope Wetness depth	 0.00 0.00 0.04 0.37 0.99
5432: Glideski-----	35	Poor Stone content Droughty Cobble content	 0.00 0.47 0.71	Poor Stones Cobble content Shrink-swell	 0.00 0.00 0.99	Poor Rock fragments Hard to reclaim (rock fragments) Slope	 0.00 0.00 0.96
Brokit-----	30	Poor Stone content Droughty Too sandy Cobble content Organic matter content low	 0.00 0.04 0.04 0.17 0.75	Poor Stones Cobble content Wetness depth	 0.00 0.00 0.99	Poor Hard to reclaim (rock fragments) Rock fragments Too sandy Slope Wetness depth	 0.00 0.00 0.04 0.96 0.99
Lemcave-----	20	Fair Droughty Too sandy Organic matter content low Stone content Cobble content Too acid	 0.08 0.16 0.32 0.58 0.79 0.84	Poor Slope Cobble content Stones	 0.00 0.04 0.62	Poor Slope Hard to reclaim (rock fragments) Rock fragments Too sandy	 0.00 0.00 0.00 0.16
5434: Lehmandow-----	90	Poor Stone content Organic matter content low	 0.00 0.92	Poor Wetness depth Stones Shrink-swell	 0.00 0.00 0.87	Poor Wetness depth Rock fragments Hard to reclaim (rock fragments)	 0.00 0.00 0.41
5440: Glaciers-----	85	Not rated		Not rated		Not rated	

TABLE 22.--ENGINEERING PROPERTIES

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1650: Noski-----	0-2	Gravelly loam	SM, SC-SM	A-4, A-2	0	0-18	75-85	49-74	40-63	30-45	20-29	3-6
	2-7	Very gravelly loam	GM, GC-GM, SC-SM, SM	A-1, A-2	0	0-18	55-80	30-54	25-45	20-32	20-27	3-6
	7-15	Very gravelly sandy loam, extremely gravelly sandy loam, very gravelly fine sandy loam	GC-GM, SC-SM, SC, GC	A-2	0	0-20	55-70	25-35	25-35	20-30	22-29	5-8
	15-25	Bedrock			---	---	---	---	---	---	---	---
Cedarcabin-----	0-3	Gravelly loam	SC	A-4, A-2	0	9-17	80-90	50-70	35-60	31-47	28-37	9-13
	3-9	Very gravelly loam	SC	A-4, A-2	0	10-27	60-75	31-55	26-51	19-37	28-37	9-13
	9-31	Very gravelly loam, very gravelly fine sandy loam, extremely gravelly sandy clay loam	SC, GC	A-2	0	10-31	50-75	17-42	16-35	10-30	30-40	12-19
	31-35	Bedrock			---	---	---	---	---	---	---	---
	35-37	Bedrock			---	---	---	---	---	---	---	---
Noski-----	0-2	Gravelly loam	SM, SC-SM	A-4, A-2	0	0-18	75-85	49-74	40-63	30-45	20-29	3-6
	2-7	Very gravelly loam	GM, GC-GM, SC-SM, SM	A-1, A-2	0	0-18	55-80	30-54	25-45	20-32	20-27	3-6
	7-15	Very gravelly sandy loam, extremely gravelly sandy loam, very gravelly fine sandy loam	GC-GM, SC-SM, SC, GC	A-2	0	0-20	55-70	25-35	25-35	20-30	22-29	5-8
	15-25	Bedrock			---	---	---	---	---	---	---	---
1652: Noski-----	0-2	Gravelly loam	SM, SC-SM	A-4, A-2	0	0-18	75-85	49-74	40-63	30-45	20-29	3-6
	2-7	Very gravelly loam	GM, GC-GM, SC-SM, SM	A-1, A-2	0	0-18	55-80	30-54	25-45	20-32	20-27	3-6
	7-15	Very gravelly sandy loam, extremely gravelly sandy loam, very gravelly fine sandy loam	GC-GM, SC-SM, SC, GC	A-2	0	0-20	55-70	25-35	25-35	20-30	22-29	5-8
	15-25	Bedrock			---	---	---	---	---	---	---	---
Canyonfork-----	0-8	Very gravelly fine sandy loam	SM, SC-SM, GM, GC-GM	A-1, A-2	0	0-10	55-85	28-55	25-50	12-30	19-29	3-6
	8-60	Extremely gravelly fine sandy loam, very gravelly loam	SP-SC, SC, GP-GC, GC	A-2	0	9-20	45-70	17-35	15-30	5-20	23-31	7-12

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Cedarcabin-----	0-3	Gravelly loam	SC	A-4, A-2	0	9-17	80-90	50-70	35-60	31-47	28-37	9-13
	3-9	Very gravelly loam	SC	A-4, A-2	0	10-27	60-75	31-55	26-51	19-37	28-37	9-13
	9-31	Very gravelly loam, very gravelly fine sandy loam, extremely gravelly sandy clay loam	SC, GC	A-2	0	10-31	50-75	17-42	16-35	10-30	30-40	12-19
	31-35	Bedrock			---	---	---	---	---	---	---	---
	35-37	Bedrock			---	---	---	---	---	---	---	---
1700: Eenreed-----	0-5	Very gravelly loam	GM	A-1, A-2	0-10	0-15	45-65	30-50	25-40	20-30	20-25	NP-5
	5-12	Very gravelly loam, extremely gravelly loam	GC	A-2	0-10	0-15	45-65	30-50	25-40	20-30	25-35	10-15
	12-60	Extremely gravelly loam, extremely gravelly sandy loam	GW-GC, GP-GC, GM, GP, GP- GM, GC-GM	A-1, A-2	0-10	5-25	25-45	10-25	5-20	0-15	20-30	NP-10
Millan-----	0-6	Very gravelly loam	GC, GC-GM	A-2	0-5	0-15	45-65	25-45	20-40	15-30	25-30	5-10
	6-16	Extremely gravelly clay loam, very gravelly clay loam	GC	A-2	0-5	0-15	35-55	10-35	10-30	10-25	35-40	15-20
	16-60	Extremely gravelly sandy loam, very gravelly loam	GM, GP-GM	A-1	0-5	0-15	35-55	10-35	10-30	5-15	20-25	NP-5
Eenreed-----	0-5	Very gravelly loam	GM	A-1, A-2	0-10	0-15	45-65	30-50	25-40	20-30	20-25	NP-5
	5-12	Very gravelly loam, extremely gravelly loam	GC	A-2	0-10	0-15	45-65	30-50	25-40	20-30	25-35	10-15
	12-60	Extremely gravelly loam, extremely gravelly sandy loam	GW-GC, GC-GM, GM, GP, GP- GC, GP-GM	A-1, A-2	0-10	5-25	25-45	10-25	5-20	0-15	20-30	NP-10
1900: Borvant-----	0-8	Extremely gravelly loam	GW-GM, GM, GP-GM	A-1	0-5	0-15	20-40	7-27	5-15	5-15	20-25	NP-5
	8-14	Extremely gravelly loam	GW-GM, GM, GP-GM	A-1	0-10	0-15	20-40	7-27	5-15	5-15	20-25	NP-5
	14-25	Cemented material			---	---	---	---	---	---	---	---
	25-60	Extremely gravelly loamy sand	GP, GP-GM	A-1	0-10	0-15	20-40	7-27	5-15	0-10	0-14	NP
2000: Closkey-----	0-8	Very gravelly loamy coarse sand	SW-SM, SP-SM	A-1	0-5	0-10	80-90	35-50	20-25	5-10	0-14	NP
	8-16	Very gravelly sandy loam	SM	A-1	0-5	0-10	80-90	35-50	25-35	15-20	20-25	NP-5
	16-26	Very gravelly sandy clay loam	SC-SM, SM, SC	A-2	0-5	0-10	80-90	35-50	25-35	15-25	25-35	5-10
	26-60	Bedrock			---	---	---	---	---	---	---	---

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
2101:												
Radol-----	0-2	Very gravelly loam	GC	A-2, A-1, A-6	0-11	0-56	50-73	33-54	33-52	16-41	20-35	5-15
	2-15	Extremely cobbly loam, very gravelly loam	GC	A-2	0-11	0-55	51-67	34-42	29-41	22-33	30-35	10-15
	15-25	Bedrock			---	---	---	---	---	---	---	---
Logring-----	0-3	Extremely gravelly loam	GC, GC-GM	A-2	0	0-15	35-60	13-31	10-30	10-25	20-25	5-10
	3-10	Very gravelly loam, very gravelly sandy loam	GC, GC-GM	A-2	0	0-10	35-55	30-45	25-35	15-25	20-25	5-10
	10-20	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop---	---	---	---	---	---	---	---	---	---	---	---	---
2103:												
Radol-----	0-2	Very gravelly loam	GC	A-2, A-1, A-6	0-11	0-56	50-73	33-54	33-52	16-41	20-35	5-15
	2-15	Extremely cobbly loam, very gravelly loam	GC	A-2	0-11	0-55	51-67	34-42	29-41	22-33	30-35	10-15
	15-25	Bedrock			---	---	---	---	---	---	---	---
Hyzen-----	0-2	Extremely stony loam	GM	A-1, A-2	25-50	5-40	30-60	20-50	20-35	15-30	25-35	NP-5
	2-12	Extremely stony loam, extremely cobbly loam	GM	A-2, A-1	20-40	10-40	30-50	20-45	10-35	10-30	25-35	NP-5
	12-16	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop---	---	---	---	---	---	---	---	---	---	---	---	---
2111:												
Garnel-----	0-7	Very gravelly coarse sandy loam	SM	A-1	5-25	0-15	50-85	35-60	15-30	10-20	20-25	NP-5
	7-12	Very gravelly sandy clay loam	SC	A-2	0-10	0-15	70-80	25-50	15-30	15-25	30-35	10-15
	12-20	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop---	---	---	---	---	---	---	---	---	---	---	---	---
2430:												
Bellenmine-----	0-5	Extremely gravelly sandy loam	GM	A-1	5-25	0-20	45-60	10-30	10-30	10-25	20-25	NP-5
	5-18	Very gravelly clay loam, extremely gravelly clay loam	GC	A-2	0-10	0-20	35-55	30-45	10-40	10-30	30-40	15-20
	18-28	Bedrock			---	---	---	---	---	---	---	---
Basinpeak-----	0-11	Very gravelly loam	SC	A-2	10-20	10-20	65-80	35-50	30-45	20-30	25-35	10-15
	11-60	Extremely gravelly loam, extremely gravelly coarse sandy loam	GP-GC, SP-SC, SW-SC	A-2	0-10	5-25	50-60	10-30	10-15	5-10	25-35	10-15

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
2432: Majorsplace-----	0-7	Very gravelly loam	GC, SC	A-6, A-2	0-5	18-37	50-80	32-61	30-55	25-45	30-35	10-15
	7-13	Extremely cobbly clay loam	GC, CL, SC	A-6, A-2	0-10	43-54	45-85	30-74	25-70	25-55	30-40	10-15
	13-18	Extremely cobbly loam	GC	A-2	0-10	43-54	35-65	19-53	15-50	10-35	30-35	10-15
	18-28	Bedrock			---	---	---	---	---	---	---	---
Checkett-----	0-3	Extremely gravelly loam	GC, GC-GM	A-1, A-2	5-10	30-40	30-45	25-35	25-35	20-30	25-35	5-15
	3-10	Extremely gravelly clay loam, very gravelly clay loam	GC	A-6, A-2	0	10-15	40-60	30-55	30-50	25-40	30-40	10-15
	10-17	Very gravelly clay loam, very cobbly clay loam, extremely gravelly clay loam	GC, CL	A-6	0	20-45	45-80	35-75	35-70	30-55	30-40	10-15
	17-27	Bedrock			---	---	---	---	---	---	---	---
Grube-----	0-5	Extremely cobbly loam	GC, SC	A-6	10-20	40-50	55-80	50-75	45-65	35-50	25-35	10-15
	5-11	Extremely cobbly loam	GC	A-2	0-10	40-50	35-50	30-45	25-35	20-30	25-35	10-15
	11-26	Extremely cobbly clay loam	GC	A-2	0-10	40-50	35-50	30-45	30-40	25-30	35-40	15-20
	26-39	Extremely cobbly clay loam	GC	A-2	0-10	40-50	35-50	30-45	30-40	25-30	35-40	15-20
	39-60	Extremely cobbly loam	GC, GC-GM	A-2	0-10	40-50	35-50	30-45	25-35	20-30	20-25	5-10
3344: Badena-----	0-12	Extremely stony loam	GM	A-1, A-2	10-30	25-50	25-55	20-50	15-45	10-35	20-25	NP-5
	12-36	Extremely cobbly clay loam, extremely cobbly sandy clay loam, extremely cobbly loam, extremely stony clay loam	GC	A-2	10-35	25-50	25-55	20-45	15-40	10-30	30-35	10-15
	36-60	Extremely cobbly loamy coarse sand, extremely stony coarse sand, extremely cobbly loamy sand	GP, GP-GM	A-1	10-35	25-50	25-55	20-45	10-30	2-10	20-25	NP-5
Badena-----	0-12	Extremely stony sandy loam	GM	A-1, A-2	35-45	30-50	45-65	40-55	15-45	10-35	20-25	NP-5
	12-36	Extremely cobbly clay loam, extremely cobbly sandy clay loam, extremely cobbly loam, extremely stony clay loam	GC	A-2	10-35	25-50	25-55	20-45	15-40	10-30	30-35	10-15
	36-60	Extremely cobbly loamy coarse sand, extremely stony coarse sand, extremely cobbly loamy sand	GP, GP-GM	A-1	10-35	25-50	25-55	20-45	10-30	2-10	20-25	NP-5

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
3439: Eaglepass-----	0-2	Extremely gravelly loam	GM	A-1, A-2	13-24	24-45	20-58	9-48	5-40	5-30	15-25	NP-5
	2-6	Extremely gravelly loam, extremely gravelly sandy loam, extremely stony loam	GP-GM, GM	A-1	0-20	0-20	30-65	16-29	10-25	10-25	15-25	NP-5
	6-16	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	---	---	---	---	---	---	---	---	---	---	---	---
Amtoft-----	0-6	Very gravelly loam	GC, GC-GM	A-2	0	0	30-55	25-50	20-45	15-35	25-35	5-15
	6-12	Very gravelly loam, extremely gravelly loam	GC, GC-GM	A-2	0	0-12	25-55	20-50	15-45	10-35	20-35	5-15
	12-16	Bedrock			---	---	---	---	---	---	---	---
3900: Osditch-----	0-1	Extremely stony slightly decomposed plant material	PT	A-8	45-53	33-36	55-65	10-25	7-20	5-17	---	---
	1-3	Extremely stony loam	GM	A-1, A-2, A-4	25-45	15-45	35-65	20-55	20-50	15-40	25-35	NP-10
	3-18	Extremely stony sandy loam, extremely cobbly loam, extremely cobbly sandy loam	GM, SM	A-1, A-2	15-40	15-40	35-70	20-50	15-40	10-30	25-35	NP-10
	18-60	Extremely stony sandy loam, extremely cobbly loam, extremely cobbly sandy loam	GM, SM	A-1, A-2	20-40	15-35	35-70	25-60	15-40	10-25	25-35	NP-10
4140: Lodar-----	0-3	Very gravelly loam	GC-GM, GC	A-4, A-2	0	0-10	30-55	20-50	15-45	10-40	25-35	5-10
	3-7	Very gravelly sandy loam, very gravelly loam	GP-GC, GC-GM, GC	A-4, A-2	0	5-15	30-55	20-50	15-45	5-40	25-35	5-10
	7-19	Extremely gravelly loam, very gravelly loam, very cobbly loam	GP-GC, GC-GM, GC	A-2	0	5-15	15-30	10-25	10-25	5-20	25-35	5-10
	19-25	Bedrock			---	---	---	---	---	---	---	---
Monarch-----	0-6	Very cobbly sandy loam	CL-ML, GC-GM, GM	A-4	0-5	15-35	55-75	50-70	50-60	40-60	15-25	NP-10
	6-17	Very gravelly loam, very gravelly fine sandy loam	GM	A-1, A-2	0-5	0-25	35-55	25-50	20-45	15-30	15-25	NP-5
	17-27	Bedrock			---	---	---	---	---	---	---	---
Highup-----	0-10	Extremely gravelly silt loam	GC-GM	A-1	0-5	0-6	55-65	14-35	13-35	9-25	25-30	5-10
	10-25 25-35	Extremely gravelly loam Bedrock	GC-GM	A-1	0-5 ---	0-6 ---	55-65 ---	14-35 ---	13-35 ---	9-25 ---	25-30 ---	5-10 ---

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
4200: Wardbay-----	0-18	Extremely gravelly loam	SC, GC, GC- GM, GM	A-2	0	5-15	55-75	5-28	5-28	5-25	31-45	11-18
	18-42	Extremely cobbly silt loam, extremely gravelly silt loam, very cobbly silt loam	GC, GC-GM	A-2	0-5	20-50	45-55	5-50	5-50	5-45	31-43	12-19
	42-52	Bedrock			---	---	---	---	---	---	---	---
Haunchee-----	0-3	Very stony loam	SC, GC-GM, GC	A-2	10-25	10-25	60-75	35-60	30-55	20-40	20-30	5-10
	3-15	Very gravelly loam, extremely gravelly loam, very gravelly very fine sandy loam	GC-GM, GC	A-2	3-10	5-20	50-60	25-40	20-40	15-30	20-30	5-10
	15-25	Bedrock			---	---	---	---	---	---	---	---
Muiral-----	0-2	Gravelly moderately decomposed plant material	PT	A-8	0	0-3	60-85	30-60	25-55	20-40	---	---
	2-6	Gravelly loam	SC	A-4, A-2	0	0-3	65-85	50-70	45-65	30-50	23-31	7-12
	6-39	Very gravelly silt loam, very gravelly loam	GC	A-2, A-4	0-10	10-25	50-70	35-55	30-50	25-45	23-30	7-12
	39-49	Bedrock			---	---	---	---	---	---	---	---
5100: Logring-----	0-3	Extremely gravelly loam	GC, GC-GM	A-2	0	0-15	35-60	13-31	10-30	10-25	20-25	5-10
	3-10	Very gravelly loam, very gravelly sandy loam	GC, GC-GM	A-2	0	0-10	35-55	30-45	25-35	15-25	20-25	5-10
	10-20	Bedrock			---	---	---	---	---	---	---	---
Hyzen-----	0-2	Extremely stony loam	GM	A-1, A-2	25-50	5-40	30-60	20-50	20-35	15-30	25-35	NP-5
	2-12	Extremely stony loam, extremely cobbly loam	GM	A-2, A-1	20-40	10-40	30-50	20-45	10-35	10-30	25-35	NP-5
	12-16	Bedrock			---	---	---	---	---	---	---	---
Canyoung-----	0-12	Extremely gravelly loam	GM	A-1	0-5	8-16	25-40	13-36	10-30	10-25	20-25	NP-5
	12-60	Extremely gravelly loam	GM, GP-GM	A-1	0-5	0-10	20-35	18-28	15-25	10-23	20-25	NP-5
5102: Canyoung-----	0-12	Extremely gravelly loam	GM	A-1	0-5	8-16	25-40	13-36	10-30	10-25	20-25	NP-5
	12-60	Extremely gravelly loam	GM, GP-GM	A-1	0-5	0-10	20-35	18-28	15-25	10-23	20-25	NP-5
Zarark-----	0-4	Very gravelly loam	SC, SC-SM	A-2, A-1	0	0-3	70-85	30-50	25-45	15-30	20-30	5-10
	4-18	Very gravelly fine sandy loam, very gravelly loam, very gravelly sandy loam	SC, SC-SM	A-2, A-1	0	5-20	50-65	25-40	20-35	10-20	20-30	5-10
	18-28	Very gravelly sandy loam, very gravelly fine sandy loam	GC-GM, SC-SM, GC, SC	A-1, A-2	0	5-25	50-65	30-50	20-35	10-20	20-30	5-10
	28-37	Bedrock			---	---	---	---	---	---	---	---

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct 0	Pct 5-15	55-75	5-28	5-28	5-25	Pct 31-45	11-18
Wardbay-----	0-18	Extremely gravelly loam	SC, GC, GC- GM, GM	A-2	0	5-15	55-75	5-28	5-28	5-25	31-45	11-18
	18-42	Extremely cobbly silt loam, extremely gravelly silt loam, very cobbly silt loam	GC, GC-GM	A-2	0-5	20-50	45-55	5-50	5-50	5-45	31-43	12-19
	42-52	Bedrock			---	---	---	---	---	---	---	---
5110: Garnel-----	0-7	Very gravelly coarse sandy loam	SM	A-1	5-25	0-15	50-85	35-60	15-30	10-20	20-25	NP-5
	7-12	Very gravelly sandy clay loam	SC	A-2	0-10	0-15	70-80	25-50	15-30	15-25	30-35	10-15
	12-20	Bedrock			---	---	---	---	---	---	---	---
Garnel, very steep-----	0-7	Very gravelly coarse sandy loam	SM	A-1	5-25	0-15	50-85	35-60	15-30	10-20	20-25	NP-5
	7-12	Very gravelly sandy clay loam	SC	A-2	0-10	0-15	70-80	25-50	15-30	15-25	30-35	10-15
	12-20	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	---	---	---	---	---	---	---	---	---	---	---	---
5140: Wardbay-----	0-18	Extremely gravelly loam	SC, GC, GC- GM, GM	A-2	0	5-15	55-75	5-28	5-28	5-25	31-45	11-18
	18-42	Extremely cobbly silt loam, extremely gravelly silt loam, very cobbly silt loam	GC, GC-GM	A-2	0-5	20-50	45-55	5-50	5-50	5-45	31-43	12-19
	42-52	Bedrock			---	---	---	---	---	---	---	---
Canyoung-----	0-12	Extremely gravelly loam	GM	A-1	0-5	8-16	25-40	13-36	10-30	10-25	20-25	NP-5
	12-60	Extremely gravelly loam	GM, GP-GM	A-1	0-5	0-10	20-35	18-28	15-25	10-23	20-25	NP-5
Rock outcrop----	---	---	---	---	---	---	---	---	---	---	---	---
5160: Hyzen-----	0-2	Extremely stony loam	GM	A-1, A-2	25-50	5-40	30-60	20-50	20-35	15-30	25-35	NP-5
	2-12	Extremely stony loam, extremely cobbly loam	GM	A-2, A-1	20-40	10-40	30-50	20-45	10-35	10-30	25-35	NP-5
	12-16	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	---	---	---	---	---	---	---	---	---	---	---	---
5210: Badhap-----	0-3	Very stony loam	GC	A-2	0-20	0-12	40-60	25-50	25-45	20-40	25-35	10-15
	3-44	Very gravelly loam, extremely cobbly loam	GC, SC	A-2, A-6	0-12	20-60	35-65	20-55	20-50	15-40	25-35	10-15
	44-60	Extremely gravelly loam, extremely cobbly loam	GC	A-2	0-12	20-60	35-65	20-55	20-50	15-40	25-35	10-15

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Badhap-----	0-3	Very gravelly loam	GC	A-2	0	0-12	40-60	25-50	25-45	20-40	25-35	10-15
	3-44	Very gravelly loam, extremely cobbly loam	GC, SC	A-2, A-6	0-12	20-60	35-65	20-55	20-50	15-40	25-35	10-15
	44-60	Extremely gravelly loam, extremely cobbly loam	GC	A-2	0-12	20-60	35-65	20-55	20-50	15-40	25-35	10-15
Topeki-----	0-12	Extremely gravelly loam	GC	A-2	10-25	10-30	30-50	15-40	15-35	10-25	25-35	10-15
	12-15	Extremely stony loam	GC, SC	A-2, A-6	45-60	10-30	50-80	40-70	35-65	25-45	25-35	10-15
	15-25	Bedrock			---	---	---	---	---	---	---	---
5220:												
Basinpeak-----	0-11	Very gravelly loam	SC	A-2	10-20	10-20	65-80	35-50	30-45	20-30	25-35	10-15
	11-60	Extremely gravelly loam, extremely gravelly coarse sandy loam	GP-GC, SP-SC, SW-SC	A-2	0-10	5-25	50-60	10-30	10-15	5-10	25-35	10-15
Badhap-----	0-3	Very gravelly loam	GC	A-2	0	0-12	40-60	25-50	25-45	20-40	25-35	10-15
	3-44	Very gravelly loam, extremely cobbly loam	GC, SC	A-2, A-6	0-12	20-60	35-65	20-55	20-50	15-40	25-35	10-15
	44-60	Extremely gravelly loam, extremely cobbly loam	GC	A-2	0-12	20-60	35-65	20-55	20-50	15-40	25-35	10-15
5240:												
Wardbay-----	0-18	Extremely gravelly loam	SC, GC, GC- GM, GM	A-2	0	5-15	55-75	5-28	5-28	5-25	31-45	11-18
	18-42	Extremely cobbly silt loam, extremely gravelly silt loam, very cobbly silt loam	GC, GC-GM	A-2	0-5	20-50	45-55	5-50	5-50	5-45	31-43	12-19
	42-52	Bedrock			---	---	---	---	---	---	---	---
Haunchee-----	0-3	Very stony loam	SC, GC-GM, GC	A-2	10-25	10-25	60-75	35-60	30-55	20-40	20-30	5-10
	3-15	Very gravelly loam, extremely gravelly loam, very gravelly very fine sandy loam	GC-GM, GC	A-2	3-10	5-20	50-60	25-40	20-40	15-30	20-30	5-10
	15-25	Bedrock			---	---	---	---	---	---	---	---
Bakerpeak-----	0-1	Very gravelly slightly decomposed plant material	PT	A-8	0-20	17-50	45-55	10-25	10-20	7-20	---	---
	1-5	Very gravelly loam	GC, SC	A-2	0-10	5-25	55-70	30-50	25-40	20-30	25-35	10-15
	5-13	Extremely gravelly loam, very gravelly loam, very gravelly sandy loam	GC, SC	A-2	0-10	5-25	50-70	10-35	10-30	10-20	25-35	10-15
	13-61	Extremely gravelly loam, very gravelly sandy loam, extremely gravelly sandy loam	GC, SC, GC- GM, SC-SM	A-1, A-2	0-10	5-25	50-70	10-35	10-30	10-20	20-30	4-10

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5241:												
Haunchee-----	0-3	Very stony loam	SC, GC-GM, GC	A-2	10-25	10-25	60-75	35-60	30-55	20-40	20-30	5-10
	3-15	Very gravelly loam, extremely gravelly loam, very gravelly very fine sandy loam	GC-GM, GC	A-2	3-10	5-20	50-60	25-40	20-40	15-30	20-30	5-10
	15-25	Bedrock			---	---	---	---	---	---	---	---
Canyoung-----	0-12	Extremely gravelly loam	GM	A-1	0-5	8-16	25-40	13-36	10-30	10-25	20-25	NP-5
	12-60	Extremely gravelly loam	GM, GP-GM	A-1	0-5	0-10	20-35	18-28	15-25	10-23	20-25	NP-5
Rock outcrop----	---	---	---	---	---	---	---	---	---	---	---	---
5250:												
Bricone-----	0-3	Very gravelly fine sandy loam	GC, SC-SM, SC	A-2	0-10	3-20	50-60	35-50	30-45	10-20	23-30	7-12
	3-13	Extremely gravelly fine sandy loam, very gravelly sandy loam, very gravelly loam	GW-GC, GP, SP-SC	A-2	0	3-10	45-55	10-25	10-25	3-10	23-30	7-12
	13-23	Bedrock			---	---	---	---	---	---	---	---
Piar-----	0-1	Very gravelly slightly decomposed plant material	PT	A-8	0-20	0-40	40-50	10-25	8-22	5-15	---	---
	1-3	Very gravelly loam	GC-GM, GM	A-1, A-2	0-5	0-15	40-60	30-50	25-40	20-30	20-30	NP-10
	3-13	Very gravelly loam, extremely gravelly loam	GC-GM, GM	A-1, A-2	0-10	0-15	20-45	10-35	10-30	10-20	20-30	NP-10
	13-53	Extremely gravelly loam, very gravelly sandy loam, extremely gravelly fine sandy loam	GC-GM, GM	A-1, A-2	0-10	0-15	25-45	15-35	15-30	10-20	20-30	NP-10
	53-63	Bedrock			---	---	---	---	---	---	---	---
Linpeak-----	0-2	Gravelly slightly decomposed plant material	PT	A-8	0-17	0-26	55-65	25-45	20-40	17-30	---	---
	2-3	Gravelly loam	GM, SM	A-2, A-4	0-5	0-5	55-80	50-75	50-60	30-40	20-25	NP-5
	3-14	Very gravelly loam, extremely gravelly loam	GM	A-2, A-4	0-5	0-10	40-60	35-50	30-45	25-40	20-25	NP-5
	14-32	Very gravelly loam, extremely gravelly loam	GC	A-2	0-5	0-10	40-60	35-50	30-45	25-40	25-35	10-15
	32-62	Extremely gravelly loam, very gravelly loam	GC, GP-GC	A-2	0-5	0-25	15-40	10-35	5-25	5-20	25-35	10-15

TABLE 22.--ENGINEERING PROPERTIES

[illegible]

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Bricone-----	0-3	Very gravelly fine sandy loam	GC, SC-SM, SC	A-2	0-10	3-20	50-60	35-50	30-45	10-20	23-30	7-12
	3-13	Extremely gravelly fine sandy loam, very gravelly sandy loam, very gravelly loam	GW-GC, GP, SP-SC	A-2	0	3-10	45-55	10-25	10-25	3-10	23-30	7-12
	13-23	Bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	---	---	---	---	---	---	---	---	---	---	---	---
5255: Wayhigh-----	0-3	Very gravelly moderately decomposed plant material	PT	A-8	0	10-25	60-70	15-35	10-25	7-15	---	---
	3-8	Very gravelly fine sandy loam	SC, SC-SM	A-1, A-2	0	10-25	70-85	40-50	25-40	15-30	21-33	4-10
	8-35	Very gravelly fine sandy loam, extremely cobbly fine sandy loam, extremely gravelly fine sandy loam	GP-GC, GC, SP-SC, SC	A-2	0	10-30	50-65	20-40	15-30	5-15	22-31	7-11
	35-45	Bedrock			---	---	---	---	---	---	---	---
5261: Jonlake-----	0-14	Extremely gravelly loam	GC	A-2	0-5	5-20	25-45	10-25	10-20	10-15	25-35	10-15
	14-17	Extremely gravelly loam, very gravelly loam	GC	A-2	0-5	0-20	25-50	10-35	10-35	10-25	25-35	10-15
	17-21	Bedrock			---	---	---	---	---	---	---	---
Badhap-----	0-3	Very stony loam	GC	A-2	0-20	0-12	40-60	25-50	25-45	20-40	25-35	10-15
	3-44	Very gravelly loam, extremely cobbly loam	GC, SC	A-2, A-6	0-12	20-60	35-65	20-55	20-50	15-40	25-35	10-15
	44-60	Extremely gravelly loam, extremely cobbly loam	GC	A-2	0-12	20-60	35-65	20-55	20-50	15-40	25-35	10-15
Berrycreek-----	0-2	Very gravelly moderately decomposed plant material	PT	A-8	0	0	45-55	10-30	10-25	7-20	---	---
	2-13	Very gravelly loam	GC	A-2	0	0-20	45-60	15-40	15-30	10-25	29-43	12-18
	13-60	Extremely gravelly sandy clay loam, very gravelly loam, extremely gravelly loam, very gravelly sandy clay loam	GC, SC	A-2	0	0-20	55-67	22-50	20-45	15-30	28-39	12-19

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5270: Bakerpeak-----	0-1	Very gravelly slightly decomposed plant material	PT	A-8	0-20	17-50	45-55	10-25	10-20	7-20	---	---
	1-5	Very gravelly loam	GC, SC	A-2	0-10	5-25	55-70	30-50	25-40	20-30	25-35	10-15
	5-13	Extremely gravelly loam, very gravelly loam, very gravelly sandy loam	GC, SC	A-2	0-10	5-25	50-70	10-35	10-30	10-20	25-35	10-15
	13-61	Extremely gravelly loam, very gravelly sandy loam, extremely gravelly sandy loam	GC, SC, GC-GM, SC-SM	A-1, A-2	0-10	5-25	50-70	10-35	10-30	10-20	20-30	4-10
Canyoung-----	0-12	Extremely gravelly loam	GM	A-1	0-5	8-16	25-40	13-36	10-30	10-25	20-25	NP-5
	12-60	Extremely gravelly loam	GM, GP-GM	A-1	0-5	0-10	20-35	18-28	15-25	10-23	20-25	NP-5
Rock outcrop----	---	---	---	---	---	---	---	---	---	---	---	---
5290: Keyole-----	0-1	Extremely gravelly slightly decomposed plant material	PT	A-8	34-41	20-41	50-60	3-15	2-10	0-5	---	---
	1-5	Extremely gravelly sandy loam	GM, SM	A-1	15-30	10-25	30-65	10-50	10-40	10-25	20-25	NP-5
	5-18	Extremely gravelly coarse sandy loam, extremely gravelly sandy loam	GM, GP-GM	A-1	0-15	0-30	30-50	10-30	10-25	5-15	20-25	NP-5
	18-60		GP	A-1	0-5	0-30	0-10	0-5	0-5	0-5	0-14	NP
Osditch-----	0-1	Extremely stony slightly decomposed plant material	PT	A-8	45-53	33-36	55-65	10-25	7-20	5-17	---	---
	1-3	Extremely stony loam	GM	A-1, A-2, A-4	25-45	15-45	35-65	20-55	20-50	15-40	25-35	NP-10
	3-18	Extremely stony sandy loam, extremely cobbly loam, extremely cobbly sandy loam	GM, SM	A-1, A-2	15-40	15-40	35-70	20-50	15-40	10-30	25-35	NP-10
	18-60	Extremely stony sandy loam, extremely cobbly loam, extremely cobbly sandy loam	GM, SM	A-1, A-2	20-40	15-35	35-70	25-60	15-40	10-25	25-35	NP-10
Topeki-----	0-12	Extremely gravelly loam	GC	A-2	10-25	10-30	30-50	15-40	15-35	10-25	25-35	10-15
	12-15	Extremely stony loam	GC, SC	A-2, A-6	45-60	10-30	50-80	40-70	35-65	25-45	25-35	10-15
	15-25	Bedrock			---	---	---	---	---	---	---	---

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5291: Keyole-----	0-1	Extremely gravelly slightly decomposed plant material	PT	A-8	34-41	20-41	50-60	3-15	2-10	0-5	---	---
	1-5	Extremely gravelly sandy loam	GM, SM	A-1	15-30	10-25	30-65	10-50	10-40	10-25	20-25	NP-5
	5-18	Extremely gravelly coarse sandy loam, extremely gravelly sandy loam	GM, GP-GM	A-1	0-15	0-30	30-50	10-30	10-25	5-15	20-25	NP-5
	18-60		GP	A-1	0-5	0-30	0-10	0-5	0-5	0-5	0-14	NP
Rubble land----	---	---	---	---	---	---	---	---	---	---	---	---
5292: Keyole-----	0-1	Extremely gravelly slightly decomposed plant material	PT	A-8	34-41	20-41	50-60	3-15	2-10	0-5	---	---
	1-5	Extremely gravelly sandy loam	GM, SM	A-1	15-30	10-25	30-65	10-50	10-40	10-25	20-25	NP-5
	5-18	Extremely gravelly coarse sandy loam, extremely gravelly sandy loam	GM, GP-GM	A-1	0-15	0-30	30-50	10-30	10-25	5-15	20-25	NP-5
	18-60		GP	A-1	0-5	0-30	0-10	0-5	0-5	0-5	0-14	NP
Osditch-----	0-1	Extremely stony slightly decomposed plant material	PT	A-8	45-53	33-36	55-65	10-25	7-20	5-17	---	---
	1-3	Extremely stony loam	GM	A-1, A-2, A-4	25-45	15-45	35-65	20-55	20-50	15-40	25-35	NP-10
	3-18	Extremely stony sandy loam, extremely cobbly loam, extremely cobbly sandy loam	GM, SM	A-1, A-2	15-40	15-40	35-70	20-50	15-40	10-30	25-35	NP-10
	18-60	Extremely stony sandy loam, extremely cobbly loam, extremely cobbly sandy loam	GM, SM	A-1, A-2	20-40	15-35	35-70	25-60	15-40	10-25	25-35	NP-10
5310: Jumble-----	0-1	Extremely stony slightly decomposed plant material	PT	A-8	40-50	29-33	40-50	10-15	10-13	5-10	---	---
	1-6	Extremely stony loam	GM	A-1	23-42	17-32	55-72	27-58	16-53	11-38	20-25	NP-5
	6-19	Extremely cobbly sandy loam, extremely stony sandy loam, very stony sandy loam	GM	A-1	9-32	16-39	54-85	24-53	12-51	6-27	20-25	NP-5
	19-61	Extremely cobbly sandy loam, extremely stony sandy loam, very stony sandy loam	GM	A-1	8-43	31-64	51-85	27-59	20-57	10-31	20-25	NP-5

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Lemcave-----	0-1	Extremely gravelly slightly decomposed plant material	PT	A-8	0-28	26-40	50-65	3-12	2-10	0-5	---	---
	1-8	Extremely gravelly sandy loam	GM, GP-GM	A-1	0-10	10-25	20-40	10-30	10-25	5-15	20-25	NP-5
	8-30	Extremely cobbly coarse sandy loam, very cobbly coarse sandy loam, extremely cobbly loamy coarse sand	GP-GM, SP-SM	A-1	5-20	25-55	15-60	10-50	5-25	5-10	20-25	NP-5
	30-61	Extremely cobbly loamy coarse sand, very cobbly loamy coarse sand, extremely gravelly loamy coarse sand	GP, GP-GM, SP, SP-SM	A-1	5-20	25-55	15-60	10-50	5-20	0-10	0-14	NP
5311: Jumble-----	0-1	Extremely stony slightly decomposed plant material	PT	A-8	40-50	29-33	40-50	10-15	10-13	5-10	---	---
	1-6	Extremely stony loam	GM	A-1	23-42	17-32	55-72	27-58	16-53	11-38	20-25	NP-5
	6-19	Extremely cobbly sandy loam, extremely stony sandy loam, very stony sandy loam	GM	A-1	9-32	16-39	54-85	24-53	12-51	6-27	20-25	NP-5
	19-61	Extremely cobbly sandy loam, extremely stony sandy loam, very stony sandy loam	GM	A-1	8-43	31-64	51-85	27-59	20-57	10-31	20-25	NP-5
Lemcave-----	0-1	Extremely gravelly slightly decomposed plant material	PT	A-8	0-28	26-40	50-65	3-12	2-10	0-5	---	---
	1-8	Extremely gravelly sandy loam	GM, GP-GM	A-1	0-10	10-25	20-40	10-30	10-25	5-15	20-25	NP-5
	8-30	Extremely cobbly coarse sandy loam, very cobbly coarse sandy loam, extremely cobbly loamy coarse sand	GP-GM, SP-SM	A-1	5-20	25-55	15-60	10-50	5-25	5-10	20-25	NP-5
	30-61	Extremely cobbly loamy coarse sand, very cobbly loamy coarse sand, extremely gravelly loamy coarse sand	GP, GP-GM, SP, SP-SM	A-1	5-20	25-55	15-60	10-50	5-20	0-10	0-14	NP

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Gaia-----	0-11	Extremely gravelly loam	GC, SC, GP- GC, SP-SC	A-2	15-30	10-25	45-65	15-40	13-35	10-25	26-37	7-12
	11-60	Extremely cobbly sandy loam, extremely gravelly sandy loam	GP, GP-GC, GC, GC-GM	A-1, A-2	0-15	30-60	35-60	5-35	3-25	2-15	20-30	4-10
5320: Wardbay-----	0-18	Extremely gravelly loam	SC, GC, GC- GM, GM	A-2	0	5-15	55-75	5-28	5-28	5-25	31-45	11-18
	18-42	Extremely cobbly silt loam, extremely gravelly silt loam, very cobbly silt loam	GC, GC-GM	A-2	0-5	20-50	45-55	5-50	5-50	5-45	31-43	12-19
	42-52	Bedrock			---	---	---	---	---	---	---	---
Wardbay, convex slopes-----	0-18	Extremely gravelly loam	SC, GC, GC- GM, GM	A-2	0	5-15	55-75	5-28	5-28	5-25	31-45	11-18
	18-42	Extremely cobbly silt loam, extremely gravelly silt loam, very cobbly silt loam	GC, GC-GM	A-2	0-5	20-50	45-55	5-50	5-50	5-45	31-43	12-19
	42-52	Bedrock			---	---	---	---	---	---	---	---
Basinpeak-----	0-11	Very gravelly loam	SC	A-2	10-20	10-20	65-80	35-50	30-45	20-30	25-35	10-15
	11-60	Extremely gravelly loam, extremely gravelly coarse sandy loam	GP-GC, SP-SC, SW-SC	A-2	0-10	5-25	50-60	10-30	10-15	5-10	25-35	10-15
5330: Rubble land-----	---	---	---	---	---	---	---	---	---	---	---	---
Wheelerpek-----	0-4	Extremely gravelly loam	GM, SM	A-1	25-40	10-30	35-65	20-50	10-35	10-25	20-25	NP-5
	4-13	Extremely cobbly sandy loam, extremely cobbly loam, extremely gravelly sandy loam	GM, SM	A-1	0-20	40-60	40-65	25-50	20-35	15-25	20-25	NP-5
	13-17	Bedrock			---	---	---	---	---	---	---	---
Cobblywheel-----	0-2	Extremely cobbly highly decomposed plant material	PT		---	---	---	---	---	---	---	---
	2-15	Extremely cobbly loam	GC, SC	A-2	0-5	20-50	50-70	30-43	20-40	15-30	23-30	7-12
	15-60	Extremely cobbly loam, extremely cobbly sandy loam	GP-GC, GC	A-2	0-5	37-59	35-50	32-50	5-20	5-15	23-30	7-12

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5340: Linpeak-----	0-2	Gravelly slightly decomposed plant material	PT	A-8	0-17	0-26	55-65	25-45	20-40	17-30	---	---
	2-3	Gravelly loam	GM, SM	A-2, A-4	0-5	0-5	55-80	50-75	50-60	30-40	20-25	NP-5
	3-14	Very gravelly loam, extremely gravelly loam	GM	A-2, A-4	0-5	0-10	40-60	35-50	30-45	25-40	20-25	NP-5
	14-32	Very gravelly loam, extremely gravelly loam	GC	A-2	0-5	0-10	40-60	35-50	30-45	25-40	25-35	10-15
	32-62	Extremely gravelly loam, very gravelly loam	GC, GP-GC	A-2	0-5	0-25	15-40	10-35	5-25	5-20	25-35	10-15
Piar-----	0-1	Very gravelly slightly decomposed plant material	PT	A-8	0-20	0-40	40-50	10-25	8-22	5-15	---	---
	1-3	Very gravelly loam	GC-GM, GM	A-1, A-2	0-5	0-15	40-60	30-50	25-40	20-30	20-30	NP-10
	3-13	Very gravelly loam, extremely gravelly loam	GC-GM, GM	A-1, A-2	0-10	0-15	20-45	10-35	10-30	10-20	20-30	NP-10
	13-53	Extremely gravelly loam, very gravelly sandy loam, extremely gravelly fine sandy loam	GC-GM, GM	A-1, A-2	0-10	0-15	25-45	15-35	15-30	10-20	20-30	NP-10
	53-63	Bedrock			---	---	---	---	---	---	---	---
Bricone-----	0-3	Very gravelly fine sandy loam	GC, SC-SM, SC	A-2	0-10	3-20	50-60	35-50	30-45	10-20	23-30	7-12
	3-13	Extremely gravelly fine sandy loam, very gravelly sandy loam, very gravelly loam	GW-GC, GP, SP-SC	A-2	0	3-10	45-55	10-25	10-25	3-10	23-30	7-12
	13-23	Bedrock			---	---	---	---	---	---	---	---
5350: Goodski-----	0-4	Very gravelly loam	SC-SM, SC	A-2	0-5	0-20	60-80	35-55	30-50	20-35	23-30	5-10
	4-17	Very gravelly coarse sandy loam	SC-SM, SC	A-2	0-15	20-35	70-92	30-45	20-30	10-20	23-30	5-10
	17-28	Very gravelly coarse sandy loam	SC-SM, SC	A-2	0-15	20-35	70-92	30-45	20-30	10-20	23-30	5-10
	28-30	Bedrock			---	---	---	---	---	---	---	---
	30-40	Bedrock			---	---	---	---	---	---	---	---
Kiou-----	0-9	Extremely gravelly loamy coarse sand	SP-SM, SP-SC	A-1	0-10	10-25	65-70	10-35	5-15	5-10	15-25	NP-5
	9-19	Very gravelly coarse sandy loam, extremely gravelly coarse sandy loam, very gravelly loamy coarse sand	SW-SM, SP-SM	A-1	0-10	10-25	65-70	10-35	5-15	5-10	20-25	NP-5
	19-60	Bedrock			---	---	---	---	---	---	---	---

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Snacreek-----	0-1	Very gravelly slightly decomposed plant material	PT	A-8	---	---	55-61	10-23	6-15	4-10	---	---
	1-18	Very gravelly coarse sandy loam	SP-SM, SM	A-1	0-5	0-20	70-85	25-50	10-25	5-20	20-25	NP-5
	18-60	Extremely gravelly coarse sandy loam	SP-SM, SP	A-1	0-5	10-30	65-75	10-35	5-15	0-10	20-25	NP-5
5380: Ceebee-----	0-2	Very stony slightly decomposed plant material	PT	A-8	30-50	24-35	40-65	10-35	10-30	5-25	---	---
	2-10	Very stony loam	SM	A-2, A-1	25-50	10-25	70-85	35-60	30-55	20-35	20-25	NP-5
	10-24	Extremely stony loamy coarse sand	SP-SM	A-1	25-45	10-30	60-75	20-45	10-20	5-10	10-15	NP
	24-62	Extremely gravelly loamy coarse sand, very cobbly coarse sandy loam	SM, GM	A-1	10-25	25-50	50-75	20-42	10-20	10-15	20-25	NP-5
Strawbcrek-----	0-2	Very bouldery slightly decomposed plant material	PT	A-8	32-46	15-23	59-65	18-30	10-20	5-12	---	---
	2-3	Very bouldery coarse sandy loam	SM	A-1	10-40	10-25	70-85	35-60	20-30	10-20	20-25	NP-5
	3-26	Extremely gravelly coarse sandy loam	SP-SM	A-1	0-15	10-25	60-75	15-35	10-20	5-10	20-25	NP-5
	26-62	Extremely cobbly loamy coarse sand	SP-SM, SM	A-1	0-15	30-55	60-80	25-45	15-25	5-15	20-25	NP-5
5381: Ceebee-----	0-2	Very stony slightly decomposed plant material	PT	A-8	30-50	24-35	40-65	10-35	10-30	5-25	---	---
	2-10	Very stony loam	SM	A-2, A-1	25-50	10-25	70-85	35-60	30-55	20-35	20-25	NP-5
	10-24	Extremely stony loamy coarse sand	SP-SM	A-1	25-45	10-30	60-75	20-45	10-20	5-10	10-15	NP
	24-62	Extremely gravelly loamy coarse sand, very cobbly coarse sandy loam	SM, GM	A-1	10-25	25-50	50-75	20-42	10-20	10-15	20-25	NP-5

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Pirapeak-----	0-1	Extremely bouldery slightly decomposed plant material	PT	A-8	49-60	25-30	50-60	5-17	3-10	2-5	---	---
	1-6	Extremely bouldery coarse sandy loam	SM	A-1	20-45	15-40	75-85	16-48	10-35	10-20	20-25	NP-5
	6-17	Very cobbly coarse sandy loam, extremely stony coarse sandy loam	SM	A-1	10-20	15-40	70-85	51-85	25-55	15-30	20-25	NP-5
	17-61	Extremely cobbly loamy coarse sand, extremely stony loamy coarse sand	SW-SM, SP, SP-SM	A-1	10-40	15-50	70-85	20-50	10-20	0-10	0-14	NP
5410: Timmercrek-----	0-1	Very gravelly slightly decomposed plant material	PT	A-8	0-45	0-21	55-65	10-22	7-20	5-13	---	---
	1-13	Very gravelly highly organic loam	SC	A-2	0-26	0-25	55-75	35-55	30-50	15-35	29-42	10-17
	13-35	Extremely gravelly sandy loam, extremely gravelly loamy coarse sand	GP-GM, GM	A-1	0-10	5-15	30-50	10-40	10-40	5-20	20-25	NP-5
	35-60	Extremely gravelly sandy loam	GM, GP-GM	A-1	0-15	5-15	25-45	10-25	10-20	5-15	20-25	NP-5
5420: Topeki-----	0-12	Extremely gravelly loam	GC	A-2	10-25	10-30	30-50	15-40	15-35	10-25	25-35	10-15
	12-15	Extremely stony loam	GC, SC	A-2, A-6	45-60	10-30	50-80	40-70	35-65	25-45	25-35	10-15
	15-25	Bedrock			---	---	---	---	---	---	---	---
Badhap-----	0-3	Very stony loam	GC	A-2	0-20	0-12	40-60	25-50	25-45	20-40	25-35	10-15
	3-44	Very gravelly loam, extremely cobbly loam	GC, SC	A-2, A-6	0-12	20-60	35-65	20-55	20-50	15-40	25-35	10-15
	44-60	Extremely gravelly loam, extremely cobbly loam	GC	A-2	0-12	20-60	35-65	20-55	20-50	15-40	25-35	10-15
Jonlake-----	0-14	Extremely gravelly loam	GC	A-2	0-5	5-20	25-45	10-25	10-20	10-15	25-35	10-15
	14-17	Extremely gravelly loam, very gravelly loam	GC	A-2	0-5	0-20	25-50	10-35	10-35	10-25	25-35	10-15
	17-21	Bedrock			---	---	---	---	---	---	---	---
5425: Ripcon-----	0-5	Gravelly loam	SC, SC-SM	A-2, A-4	0	0-15	65-85	45-65	45-55	30-45	25-36	6-10
	5-15	Extremely gravelly sandy loam, very gravelly loam	GC, SC, SC- SM, GC-GM	A-2	0	0-25	35-85	20-55	15-45	10-35	22-34	6-10
	15-62	Extremely gravelly sandy loam, extremely gravelly loam	SP-SC, GP-GC, GC, SC	A-2	0	6-35	48-65	13-29	10-20	5-15	24-35	8-12

TABLE 22.--ENGINEERING PROPERTIES

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Bigwash-----	0-9	Loam	CL-ML, CL	A-4	0	0	80-95	74-91	70-85	50-75	23-35	4-10
	9-60	Loam, sandy loam	SC	A-2, A-6, A-4	0	0	80-95	74-91	45-85	20-45	24-35	7-12
Glideski-----	0-4	Gravelly loam	GC-GM, SC-SM, SC	A-4	0-10	10-30	55-85	50-64	45-60	30-40	28-37	9-12
	4-14	Very cobbly loam, very gravelly loam	SC-SM, GC	A-2, A-4	2-20	10-43	50-85	40-65	35-60	25-45	30-35	10-15
	14-39	Extremely cobbly loam, extremely stony loam, extremely cobbly sandy clay loam	SC-SM, GC	A-2, A-4	15-30	20-45	50-85	40-65	35-60	25-45	30-35	10-15
	39-60	Extremely stony loam, extremely stony coarse sandy loam, extremely stony loamy coarse sand	SM, SC-SM	A-1, A-2	15-35	20-40	55-80	40-60	30-40	20-30	15-25	NP-10
5428: Rippo-----	0-6	Very cobbly moderately decomposed plant material	PT	A-8	15-25	36-50	50-75	25-60	20-55	15-40	---	---
	6-12	Very cobbly loam	SC, SC-SM	A-1, A-2, A-4	10-25	33-45	60-80	35-65	30-55	20-40	23-34	4-9
	12-60	Extremely stony sandy loam, extremely stony loam, extremely cobbly sandy loam	SC, SP-SC, GP-GC, GC	A-2	10-45	30-55	45-75	20-45	10-30	5-15	22-33	8-12
Lehmandow-----	0-10	Loam	CL	A-6, A-7	0	0	95-100	95-100	85-100	60-80	35-47	13-19
	10-60	Very stony clay loam, very stony silt loam	GC, SC	A-6, A-2, A-7	35-46	8-23	50-85	43-78	40-70	35-55	32-47	13-25
Brokit-----	0-16	Very stony peaty loam	GC-GM, GM, SC-SM, SM	A-2, A-4	25-50	15-30	60-80	45-70	40-60	30-40	20-30	NP-10
	16-60	Extremely cobbly loamy coarse sand, extremely stony coarse sand	GP-GM	A-1	10-25	40-55	45-55	30-40	15-25	5-10	10-15	NP
5430: Brokit-----	0-16	Very stony peaty loam	GC-GM, GM, SC-SM, SM	A-2, A-4	25-50	15-30	60-80	45-70	40-60	30-40	20-30	NP-10
	16-60	Extremely cobbly loamy coarse sand, extremely stony coarse sand	GP-GM	A-1	10-25	40-55	45-55	30-40	15-25	5-10	10-15	NP

TABLE 22.--ENGINEERING PROPERTIES

[illegible]

TABLE 23.--PHYSICAL PROPERTIES OF SOILS

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Saturated Hydraulic Conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	um/sec	In/in	Pct	Pct					
1650: Noski-----	0-2	8-12	1.20-1.30	10.00-100.00	0.10-0.14	0.0-2.9	1.0-3.0	.24	.49	1	5	56
	2-7	8-12	1.30-1.40	10.00-100.00	0.06-0.11	0.0-2.9	1.0-2.0	.17	.49			
	7-15	12-18	1.45-1.55	10.00-100.00	0.03-0.07	0.0-2.9	0.5-1.0	.10	.32			
	15-25	---	---	0.00-0.01	---	---	---	---	---			
Cedarcabin-----	0-3	14-20	1.20-1.35	4.00-10.00	0.11-0.14	0.0-2.9	2.0-3.0	.17	.32	2	5	56
	3-9	14-20	1.20-1.35	4.00-10.00	0.09-0.12	0.0-2.9	2.0-3.0	.10	.32			
	9-31	18-27	1.37-1.45	1.00-10.00	0.04-0.06	3.0-5.9	0.5-1.0	.05	.24			
	31-35	---	---	0.00-0.01	---	---	---	---	---			
	35-37	---	---	0.00-0.00	---	---	---	---	---			
Noski-----	0-2	8-12	1.20-1.30	10.00-100.00	0.10-0.14	0.0-2.9	1.0-3.0	.24	.49	1	5	56
	2-7	8-12	1.30-1.40	10.00-100.00	0.06-0.11	0.0-2.9	1.0-2.0	.17	.49			
	7-15	12-18	1.45-1.55	10.00-100.00	0.03-0.07	0.0-2.9	0.5-1.0	.10	.32			
	15-25	---	---	0.00-0.01	---	---	---	---	---			
1652: Noski-----	0-2	8-12	1.20-1.30	10.00-100.00	0.10-0.14	0.0-2.9	1.0-3.0	.24	.49	1	5	56
	2-7	8-12	1.30-1.40	10.00-100.00	0.06-0.11	0.0-2.9	1.0-2.0	.17	.49			
	7-15	12-18	1.45-1.55	10.00-100.00	0.03-0.07	0.0-2.9	0.5-1.0	.10	.32			
	15-25	---	---	0.00-0.01	---	---	---	---	---			
Canyonfork-----	0-8	6-10	1.17-1.37	14.00-42.00	0.07-0.11	0.0-2.9	1.0-3.0	.10	.28	5	6	48
	8-60	12-18	1.40-1.50	4.00-14.00	0.04-0.07	0.0-2.9	0.5-1.0	.05	.28			
Cedarcabin-----	0-3	14-20	1.20-1.35	4.00-10.00	0.11-0.14	0.0-2.9	2.0-3.0	.17	.32	2	5	56
	3-9	14-20	1.20-1.35	4.00-10.00	0.09-0.12	0.0-2.9	2.0-3.0	.10	.32			
	9-31	18-27	1.37-1.45	1.00-10.00	0.04-0.06	3.0-5.9	0.5-1.0	.05	.24			
	31-35	---	---	0.00-0.01	---	---	---	---	---			
	35-37	---	---	0.00-0.00	---	---	---	---	---			
1700: Eenreed-----	0-5	12-18	1.25-1.45	14.00-42.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32	5	7	38
	5-12	18-27	1.30-1.50	4.00-14.00	0.06-0.08	0.0-2.9	1.0-2.0	.05	.37			
	12-60	12-20	1.35-1.55	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.05	.32			
Millan-----	0-6	14-20	1.25-1.35	4.00-14.00	0.08-0.10	0.0-2.9	1.0-3.0	.10	.37	5	7	38
	6-16	27-35	1.35-1.50	1.40-4.00	0.08-0.10	0.0-2.9	0.5-0.8	.10	.32			
	16-60	12-18	1.40-1.60	14.00-42.00	0.06-0.08	0.0-2.9	0.5-0.8	.10	.32			
Eenreed-----	0-5	12-18	1.25-1.45	14.00-42.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32	5	7	38
	5-12	18-27	1.30-1.50	4.00-14.00	0.06-0.08	0.0-2.9	1.0-2.0	.05	.37			
	12-60	12-20	1.35-1.55	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.05	.32			
1900: Borvant-----	0-8	10-18	1.20-1.30	4.00-14.00	0.06-0.08	0.0-2.9	1.0-2.0	.10	.37	1	8	0
	8-14	10-18	1.25-1.35	4.00-14.00	0.06-0.08	0.0-2.9	0.5-0.8	.10	.37			
	14-25	---	---	0.00-0.01	---	---	---	---	---			
	25-60	6-8	1.35-1.50	42.00-141.00	0.03-0.05	0.0-2.9	0.3-0.5	.05	.24			
2000: Closkey-----	0-8	3-10	1.30-1.45	42.00-141.00	0.05-0.07	0.0-2.9	2.0-4.0	.05	.15	3	3	86
	8-16	18-27	1.30-1.45	14.00-42.00	0.07-0.09	0.0-2.9	1.0-2.0	.05	.20			
	16-26	18-27	1.35-1.50	4.00-14.00	0.10-0.12	0.0-2.9	0.5-0.8	.10	.24			
	26-60	---	---	0.01-0.42	---	---	---	---	---			
2101: Radol-----	0-2	10-25	1.04-1.29	4.00-14.00	0.06-0.12	3.0-5.9	1.3-3.0	.20	.43	1	6	48
	2-15	18-27	1.04-1.35	4.00-14.00	0.06-0.11	3.0-5.9	1.0-3.0	.10	.43			
	15-25	---	---	0.00-0.01	---	---	---	---	---			
Logring-----	0-3	8-18	1.21-1.41	4.00-14.00	0.09-0.11	0.0-2.9	1.0-2.0	.10	.32	1	8	0
	3-10	8-18	1.30-1.45	4.00-14.00	0.09-0.11	0.0-2.9	0.5-1.0	.10	.32			
	10-20	---	---	0.00-0.01	---	---	---	---	---			

TABLE 23.--PHYSICAL PROPERTIES OF SOILS

Map symbol and soil name	Depth	Clay	Moist bulk density	Saturated Hydraulic Conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	um/sec	In/in	Pct	Pct					
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
2103: Radol-----	0-2	10-25	1.04-1.29	4.00-14.00	0.06-0.12	3.0-5.9	1.3-3.0	.20	.43	1	6	48
	2-15	18-27	1.04-1.35	4.00-14.00	0.06-0.11	3.0-5.9	1.0-3.0	.10	.43			
	15-25	---	---	0.00-0.01	---	---	---	---	---			
Hyzen-----	0-2	8-18	1.20-1.30	4.00-14.00	0.06-0.09	0.0-2.9	2.0-5.0	.17	.43	1	8	0
	2-12	10-18	1.20-1.40	4.00-14.00	0.05-0.08	0.0-2.9	2.0-4.0	.15	.43			
	12-16	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
2111: Garnel-----	0-7	10-18	1.25-1.40	14.00-42.00	0.06-0.08	0.0-2.9	1.0-2.0	.10	.24	2	6	48
	7-12	20-27	1.30-1.50	4.00-14.00	0.08-0.10	0.0-2.9	0.5-0.8	.10	.28			
	12-20	---	---	0.01-0.14	---	---	---	---	---			
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
2430: Bellenmine-----	0-5	12-18	1.15-1.30	14.00-42.00	0.08-0.10	0.0-2.9	2.0-3.0	.05	.20	1	8	0
	5-18	27-35	1.20-1.40	1.40-4.00	0.10-0.12	0.0-2.9	0.0-0.5	.10	.37			
	18-28	---	---	0.00-0.01	---	---	---	---	---			
Basinpeak-----	0-11	18-25	1.25-1.40	4.00-14.00	0.08-0.10	0.0-2.9	1.0-3.0	.10	.37	5	8	0
	11-60	18-25	1.40-1.55	4.00-14.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.32			
2432: Majorsplace-----	0-7	20-27	1.10-1.20	1.00-10.00	0.08-0.11	3.0-5.9	2.0-4.0	.10	.32	1	6	48
	7-13	27-35	1.25-1.35	1.00-10.00	0.06-0.11	3.0-5.9	1.0-2.0	.05	.37			
	13-18	20-27	1.40-1.50	1.00-10.00	0.05-0.09	3.0-5.9	0.2-0.8	.10	.43			
	18-28	---	---	0.00-0.10	---	---	---	---	---			
Checkett-----	0-3	18-27	1.20-1.30	1.40-4.00	0.07-0.09	0.0-2.9	1.0-2.0	.15	.37	1	8	0
	3-10	18-35	1.30-1.40	1.40-4.00	0.11-0.13	3.0-5.9	1.0-2.0	.15	.24			
	10-17	18-35	1.35-1.45	1.40-4.00	0.11-0.13	0.0-2.9	0.5-1.0	.17	.24			
	17-27	---	---	0.00-0.01	---	---	---	---	---			
Grube-----	0-5	18-25	1.15-1.35	4.00-14.00	0.09-0.12	0.0-2.9	1.0-2.0	.10	.37	5	8	0
	5-11	18-25	1.25-1.40	4.00-14.00	0.05-0.07	0.0-2.9	1.0-2.0	.05	.37			
	11-26	28-35	1.30-1.55	1.40-4.00	0.06-0.09	0.0-2.9	0.5-1.0	.05	.28			
	26-39	28-35	1.30-1.55	1.40-4.00	0.06-0.09	0.0-2.9	0.5-1.0	.05	.28			
	39-60	10-18	1.25-1.50	4.00-14.00	0.04-0.06	0.0-2.9	0.0-0.5	.05	.32			
3344: Badena-----	0-12	12-18	1.30-1.50	4.00-14.00	0.03-0.08	0.0-2.9	1.0-2.0	.05	.37	5	8	0
	12-36	20-35	1.35-1.55	4.00-14.00	0.03-0.07	0.0-2.9	0.5-0.8	.05	.43			
	36-60	2-7	1.40-1.60	4.00-14.00	0.03-0.07	0.0-2.9	0.5-0.8	.02	.15			
Badena-----	0-12	12-18	1.30-1.50	4.00-14.00	0.03-0.08	0.0-2.9	1.0-2.0	.05	.37	5	8	0
	12-36	20-35	1.35-1.55	4.00-14.00	0.03-0.07	0.0-2.9	0.5-0.8	.05	.43			
	36-60	2-7	1.40-1.60	4.00-14.00	0.03-0.07	0.0-2.9	0.5-0.8	.02	.15			
3439: Eaglepass-----	0-2	8-18	1.20-1.40	14.00-42.00	0.06-0.10	0.0-2.9	0.5-1.0	.15	.43	1	8	0
	2-6	8-18	1.20-1.40	14.00-42.00	0.03-0.05	0.0-2.9	0.2-0.8	.10	.32			
	6-16	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
Amtoft-----	0-6	15-25	1.35-1.55	4.00-14.00	0.07-0.11	0.0-2.9	1.0-2.0	.15	.37	1	6	48
	6-12	12-27	1.40-1.60	4.00-14.00	0.06-0.11	0.0-2.9	0.5-1.0	.10	.37			
	12-16	---	---	0.00-0.01	---	---	---	---	---			
3900: Osditch-----	0-1	15-26	0.30-0.50	10.00-705.00	0.22-0.28	---	60-85	---	---	5	8	0
	1-3	18-27	1.25-1.40	4.00-14.00	0.08-0.10	0.0-2.9	0.5-0.8	.10	.37			
	3-18	15-25	1.35-1.55	4.00-14.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.32			
	18-60	15-25	1.35-1.55	4.00-14.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.32			

TABLE 23.--PHYSICAL PROPERTIES OF SOILS

Map symbol and soil name	Depth	Clay	Moist bulk density	Saturated Hydraulic Conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	um/sec	In/in	Pct	Pct					
4140:												
Lodar-----	0-3	15-25	1.15-1.30	4.00-14.00	0.04-0.09	0.0-2.9	1.0-3.0	.15	.37	1	6	48
	3-7	15-25	1.20-1.40	4.00-14.00	0.02-0.09	0.0-2.9	0.5-0.8	.10	.28			
	7-19	18-27	1.30-1.50	4.00-14.00	0.01-0.04	0.0-2.9	0.0-0.5	.05	.32			
	19-25	---	---	0.00-0.01	---	---	---	---	---			
Monarch-----	0-6	12-18	1.22-1.38	14.00-42.00	0.04-0.07	0.0-2.9	1.0-3.0	.05	.32	1	6	48
	6-17	12-18	1.25-1.45	4.00-14.00	0.05-0.12	0.0-2.9	0.6-2.0	.15	.43			
	17-27	---	---	0.00-0.01	---	---	---	---	---			
Highup-----	0-10	12-18	1.05-1.20	4.00-14.00	0.07-0.12	0.0-2.9	2.0-4.0	.10	.37	2	8	0
	10-25	12-18	1.10-1.30	4.00-14.00	0.07-0.12	0.0-2.9	0.9-1.5	.10	.43			
	25-35	---	---	0.00-0.01	---	---	---	---	---			
4200:												
Wardbay-----	0-18	18-27	1.23-1.37	4.00-14.00	0.09-0.12	2.9-6.0	2.0-4.0	.15	.37	3	8	0
	18-42	18-27	1.45-1.65	4.00-14.00	0.08-0.10	2.9-6.0	1.0-2.0	.10	.55			
	42-52	---	---	0.00-0.10	---	---	---	---	---			
Haunchee-----	0-3	10-20	1.09-1.41	4.00-10.00	0.09-0.11	0.0-2.9	2.0-4.0	.15	.43	1	6	48
	3-15	10-20	1.45-1.55	4.00-10.00	0.09-0.11	0.0-2.9	1.0-2.0	.10	.49			
	15-25	---	---	1.00-10.00	---	---	---	---	---			
Muiral-----	0-2	12-18	0.50-0.70	10.00-100.00	0.30-0.45	---	50-70	---	---	2	6	48
	2-6	12-18	1.55-1.75	4.00-14.00	0.12-0.15	0.0-2.9	0.5-0.9	.37	.43			
	6-39	12-18	1.55-1.75	4.00-14.00	0.08-0.12	0.0-2.9	0.3-0.7	.20	.49			
	39-49	---	---	0.10-0.90	---	---	---	---	---			
5100:												
Logring-----	0-3	8-18	1.21-1.41	4.00-14.00	0.09-0.11	0.0-2.9	1.0-2.0	.10	.32	1	8	0
	3-10	8-18	1.30-1.45	4.00-14.00	0.09-0.11	0.0-2.9	0.5-1.0	.10	.32			
	10-20	---	---	0.00-0.01	---	---	---	---	---			
Hyzen-----	0-2	8-18	1.20-1.30	4.00-14.00	0.06-0.09	0.0-2.9	2.0-5.0	.17	.43	1	8	0
	2-12	10-18	1.20-1.40	4.00-14.00	0.05-0.08	0.0-2.9	2.0-4.0	.15	.43			
	12-16	---	---	0.00-0.01	---	---	---	---	---			
Canyoung-----	0-12	12-18	1.25-1.40	4.00-14.00	0.06-0.08	0.0-2.9	1.0-3.0	.05	.32	5	8	0
	12-60	12-18	1.35-1.55	4.00-14.00	0.03-0.05	0.0-2.9	0.5-1.0	.05	.32			
5102:												
Canyoung-----	0-12	12-18	1.25-1.40	4.00-14.00	0.06-0.08	0.0-2.9	1.0-3.0	.05	.32	5	8	0
	12-60	12-18	1.35-1.55	4.00-14.00	0.03-0.05	0.0-2.9	0.5-1.0	.05	.32			
Zarark-----	0-4	10-18	1.21-1.31	1.00-10.00	0.09-0.12	0.0-2.9	2.0-4.0	.15	.32	2	7	38
	4-18	10-18	1.30-1.40	1.00-10.00	0.06-0.09	0.0-2.9	1.5-2.0	.05	.24			
	18-28	10-18	1.35-1.45	1.00-10.00	0.06-0.09	0.0-2.9	0.5-1.5	.10	.32			
	28-37	---	---	0.01-1.00	---	---	---	---	---			
Wardbay-----	0-18	18-27	1.23-1.37	4.00-14.00	0.09-0.12	2.9-6.0	2.0-4.0	.15	.37	3	8	0
	18-42	18-27	1.45-1.65	4.00-14.00	0.08-0.10	2.9-6.0	1.0-2.0	.10	.55			
	42-52	---	---	0.00-0.10	---	---	---	---	---			
5110:												
Garnel-----	0-7	10-18	1.25-1.40	14.00-42.00	0.06-0.08	0.0-2.9	1.0-2.0	.10	.24	2	6	48
	7-12	20-27	1.30-1.50	4.00-14.00	0.08-0.10	0.0-2.9	0.5-0.8	.10	.28			
	12-20	---	---	0.01-0.14	---	---	---	---	---			
Garnel-----	0-7	10-18	1.25-1.40	14.00-42.00	0.06-0.08	0.0-2.9	1.0-2.0	.10	.24	2	6	48
	7-12	20-27	1.30-1.50	4.00-14.00	0.08-0.10	0.0-2.9	0.5-0.8	.10	.28			
	12-20	---	---	0.01-0.14	---	---	---	---	---			
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
5140:												
Wardbay-----	0-18	18-27	1.23-1.37	4.00-14.00	0.09-0.12	2.9-6.0	2.0-4.0	.15	.37	3	8	0
	18-42	18-27	1.45-1.65	4.00-14.00	0.08-0.10	2.9-6.0	1.0-2.0	.10	.55			
	42-52	---	---	0.00-0.10	---	---	---	---	---			
Canyoung-----	0-12	12-18	1.25-1.40	4.00-14.00	0.06-0.08	0.0-2.9	1.0-3.0	.05	.32	5	8	0
	12-60	12-18	1.35-1.55	4.00-14.00	0.03-0.05	0.0-2.9	0.5-1.0	.05	.32			

TABLE 23.--PHYSICAL PROPERTIES OF SOILS

Map symbol and soil name	Depth	Clay	Moist bulk density	Saturated Hydraulic Conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	um/sec	In/in	Pct	Pct					
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
5160: Hyzen-----	0-2	8-18	1.20-1.30	4.00-14.00	0.06-0.09	0.0-2.9	2.0-5.0	.17	.43	1	8	0
	2-12	10-18	1.20-1.40	4.00-14.00	0.05-0.08	0.0-2.9	2.0-4.0	.15	.43			
	12-16	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
5210: Badhap-----	0-3	18-27	1.15-1.35	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32	5	8	0
	3-44	18-27	1.20-1.40	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32			
	44-60	18-27	1.25-1.45	4.00-14.00	0.08-0.10	0.0-2.9	0.0-0.5	.10	.32			
Badhap-----	0-3	18-27	1.15-1.35	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32	5	8	0
	3-44	18-27	1.20-1.40	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32			
	44-60	18-27	1.25-1.45	4.00-14.00	0.08-0.10	0.0-2.9	0.0-0.5	.10	.32			
Topeki-----	0-12	18-25	1.30-1.45	4.00-14.00	0.07-0.09	0.0-2.9	2.0-4.0	.05	.32	1	8	0
	12-15	18-25	1.35-1.50	4.00-14.00	0.06-0.08	0.0-2.9	1.0-2.0	.05	.37			
	15-25	---	---	0.00-0.01	---	---	---	---	---			
5220: Basinpeak-----	0-11	18-25	1.25-1.40	4.00-14.00	0.08-0.10	0.0-2.9	1.0-3.0	.10	.37	5	8	0
	11-60	18-25	1.40-1.55	4.00-14.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.32			
Badhap-----	0-3	18-27	1.15-1.35	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32	5	8	0
	3-44	18-27	1.20-1.40	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32			
	44-60	18-27	1.25-1.45	4.00-14.00	0.08-0.10	0.0-2.9	0.0-0.5	.10	.32			
5240: Wardbay-----	0-18	18-27	1.23-1.37	4.00-14.00	0.09-0.12	2.9-6.0	2.0-4.0	.15	.37	3	8	0
	18-42	18-27	1.45-1.65	4.00-14.00	0.08-0.10	2.9-6.0	1.0-2.0	.10	.55			
	42-52	---	---	0.00-0.10	---	---	---	---	---			
Haunchee-----	0-3	10-20	1.09-1.41	4.00-10.00	0.09-0.11	0.0-2.9	2.0-4.0	.15	.43	1	6	48
	3-15	10-20	1.45-1.55	4.00-10.00	0.09-0.11	0.0-2.9	1.0-2.0	.10	.49			
	15-25	---	---	1.00-10.00	---	---	---	---	---			
Bakerpeak-----	0-1	15-25	0.30-0.60	14.00-100.00	0.20-0.30	---	60-85	---	---	5	6	48
	1-5	15-25	1.25-1.45	4.00-14.00	0.08-0.10	0.0-2.9	0.5-0.8	.10	.37			
	5-13	18-25	1.30-1.45	4.00-14.00	0.07-0.09	0.0-2.9	0.5-0.8	.10	.37			
	13-61	12-18	1.30-1.45	14.00-42.00	0.04-0.08	0.0-2.9	0.5-0.8	.05	.32			
5241: Haunchee-----	0-3	10-20	1.09-1.41	4.00-10.00	0.09-0.11	0.0-2.9	2.0-4.0	.15	.43	1	6	48
	3-15	10-20	1.45-1.55	4.00-10.00	0.09-0.11	0.0-2.9	1.0-2.0	.10	.49			
	15-25	---	---	1.00-10.00	---	---	---	---	---			
Canyoung-----	0-12	12-18	1.25-1.40	4.00-14.00	0.06-0.08	0.0-2.9	1.0-3.0	.05	.32	5	8	0
	12-60	12-18	1.35-1.55	4.00-14.00	0.03-0.05	0.0-2.9	0.5-1.0	.05	.32			
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
5250: Bricone-----	0-3	12-18	1.45-1.55	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.05	.37	1	6	48
	3-13	12-18	1.55-1.75	4.00-14.00	0.05-0.08	0.0-2.9	0.5-0.8	.05	.32			
	13-23	---	---	1.40-4.00	---	---	---	---	---			
Piar-----	0-1	14-20	0.30-0.50	10.00-705.00	0.28-0.38	---	60-85	---	---	3	6	48
	1-3	14-20	1.25-1.35	14.00-42.00	0.07-0.09	0.0-2.9	0.5-0.8	.10	.32			
	3-13	14-20	1.35-1.50	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.10	.32			
	13-53	12-18	1.40-1.60	4.00-14.00	0.04-0.06	0.0-2.9	0.5-0.8	.10	.32			
	53-63	---	---	0.00-0.01	---	---	---	---	---			
Linpeak-----	0-2	12-18	0.30-0.50	10.00-705.00	0.26-0.36	---	60-85	---	---	5	6	48
	2-3	12-18	1.20-1.30	14.00-42.00	0.11-0.13	0.0-2.9	1.0-2.0	.20	.37			
	3-14	12-18	1.20-1.30	14.00-42.00	0.09-0.11	0.0-2.9	1.0-2.0	.15	.37			
	14-32	18-24	1.25-1.35	4.00-14.00	0.07-0.09	0.0-2.9	0.5-0.8	.10	.37			
	32-62	5-15	1.30-1.40	4.00-14.00	0.06-0.08	0.0-2.9	0.3-0.5	.10	.37			

TABLE 23.--PHYSICAL PROPERTIES OF SOILS

Map symbol and soil name	Depth	Clay	Moist bulk density	Saturated Hydraulic Conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	um/sec	In/in	Pct	Pct					
5251:												
Bricone-----	0-3	12-18	1.45-1.55	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.05	.37	1	6	48
	3-13	12-18	1.55-1.75	4.00-14.00	0.05-0.08	0.0-2.9	0.5-0.8	.05	.32			
	13-23	---	---	1.40-4.00	---	---	---	---	---			
Piar-----	0-1	14-20	0.30-0.50	10.00-705.00	0.28-0.38	---	60-85	---	---	3	6	48
	1-3	14-20	1.25-1.35	14.00-42.00	0.07-0.09	0.0-2.9	0.5-0.8	.10	.32			
	3-13	14-20	1.35-1.50	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.10	.32			
	13-53	12-18	1.40-1.60	4.00-14.00	0.04-0.06	0.0-2.9	0.5-0.8	.10	.32			
	53-63	---	---	0.00-0.01	---	---	---	---	---			
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
5252:												
Bricone-----	0-3	12-18	1.45-1.55	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.05	.37	1	6	48
	3-13	12-18	1.55-1.75	4.00-14.00	0.05-0.08	0.0-2.9	0.5-0.8	.05	.32			
	13-23	---	---	1.40-4.00	---	---	---	---	---			
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
5253:												
Windwash-----	0-6	5-10	1.30-1.50	10.00-100.00	0.03-0.05	0.0-2.9	0.5-0.8	.02	.10	2	6	48
	6-13	12-18	1.35-1.55	10.00-100.00	0.03-0.08	0.0-2.9	0.2-0.6	.05	.32			
	13-22	12-18	1.40-1.60	10.00-100.00	0.04-0.10	0.0-2.9	0.1-0.5	.10	.49			
	22-32	---	---	0.00-0.01	---	---	---	---	---			
Bricone-----	0-3	12-18	1.45-1.55	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.05	.37	1	6	48
	3-13	12-18	1.55-1.75	4.00-14.00	0.05-0.08	0.0-2.9	0.5-0.8	.05	.32			
	13-23	---	---	1.40-4.00	---	---	---	---	---			
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
5255:												
Wayhigh-----	0-3	8-16	0.50-0.70	10.00-100.00	0.24-0.30	---	50-70	---	---	2	6	48
	3-8	8-16	1.32-1.38	10.00-100.00	0.07-0.10	0.0-2.9	1.0-3.0	.05	.20			
	8-35	12-18	1.42-1.48	10.00-100.00	0.05-0.08	0.0-2.9	0.1-1.0	.05	.24			
	35-45	---	---	0.00-0.01	---	---	---	---	---			
5261:												
Jonlake-----	0-14	18-25	1.25-1.40	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.05	.37	1	8	0
	14-17	18-25	1.30-1.50	4.00-14.00	0.07-0.10	0.0-2.9	0.5-0.8	.05	.37			
	17-21	---	---	0.00-0.01	---	---	---	---	---			
Badhap-----	0-3	18-27	1.15-1.35	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32	5	8	0
	3-44	18-27	1.20-1.40	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32			
	44-60	18-27	1.25-1.45	4.00-14.00	0.08-0.10	0.0-2.9	0.0-0.5	.10	.32			
Berrycreek-----	0-2	18-27	0.50-0.70	10.00-100.00	0.20-0.30	---	50-80	---	---	5	8	0
	2-13	18-27	1.05-1.25	1.00-10.00	0.08-0.11	3.0-6.0	1.0-3.0	.10	.32			
	13-60	18-27	1.25-1.45	1.00-10.00	0.08-0.10	3.0-6.0	0.5-1.0	.05	.20			
5270:												
Bakerpeak-----	0-1	15-25	0.30-0.60	14.00-100.00	0.20-0.30	---	60-85	---	---	5	6	48
	1-5	15-25	1.25-1.45	4.00-14.00	0.08-0.10	0.0-2.9	0.5-0.8	.10	.37			
	5-13	18-25	1.30-1.45	4.00-14.00	0.07-0.09	0.0-2.9	0.5-0.8	.10	.37			
	13-61	12-18	1.30-1.45	14.00-42.00	0.04-0.08	0.0-2.9	0.5-0.8	.05	.32			
Canyoung-----	0-12	12-18	1.25-1.40	4.00-14.00	0.06-0.08	0.0-2.9	1.0-3.0	.05	.32	5	8	0
	12-60	12-18	1.35-1.55	4.00-14.00	0.03-0.05	0.0-2.9	0.5-1.0	.05	.32			
Rock outcrop----	---	---	---	---	---	---	---	---	---	-	---	---
5290:												
Keyole-----	0-1	10-18	0.30-0.50	42.00-62.00	0.20-0.30	---	60-85	---	---	2	8	0
	1-5	10-18	1.30-1.45	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.10	.32			
	5-18	4-8	1.35-1.50	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.05	.28			
	18-60	4-8	1.40-1.60	141.00-705.00	0.02-0.04	0.0-2.9	0.0-0.5	---	---			

Map symbol and soil name	Depth	Clay	Moist bulk density	Saturated Hydraulic Conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	um/sec	In/in	Pct	Pct					
Osditch-----	0-1	15-26	0.30-0.50	10.00-705.00	0.22-0.28	---	60-85	---	---	5	8	0
	1-3	18-27	1.25-1.40	4.00-14.00	0.08-0.10	0.0-2.9	0.5-0.8	.10	.37			
	3-18	15-25	1.35-1.55	4.00-14.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.32			
	18-60	15-25	1.35-1.55	4.00-14.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.32			
Topeki-----	0-12	18-25	1.30-1.45	4.00-14.00	0.07-0.09	0.0-2.9	2.0-4.0	.05	.32	1	8	0
	12-15	18-25	1.35-1.50	4.00-14.00	0.06-0.08	0.0-2.9	1.0-2.0	.05	.37			
	15-25	---	---	0.00-0.01	---	---	---	---	---			
5291: Keyole-----	0-1	10-18	0.30-0.50	42.00-62.00	0.20-0.30	---	60-85	---	---	2	8	0
	1-5	10-18	1.30-1.45	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.10	.32			
	5-18	4-8	1.35-1.50	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.05	.28			
	18-60	4-8	1.40-1.60	141.00-705.00	0.02-0.04	0.0-2.9	0.0-0.5	---	---			
Rubble land----	---	---	---	---	---	---	---	---	---	-	---	---
5292: Keyole-----	0-1	10-18	0.30-0.50	42.00-62.00	0.20-0.30	---	60-85	---	---	2	8	0
	1-5	10-18	1.30-1.45	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.10	.32			
	5-18	4-8	1.35-1.50	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.05	.28			
	18-60	4-8	1.40-1.60	141.00-705.00	0.02-0.04	0.0-2.9	0.0-0.5	---	---			
Osditch-----	0-1	15-26	0.30-0.50	10.00-705.00	0.22-0.28	---	60-85	---	---	5	8	0
	1-3	18-27	1.25-1.40	4.00-14.00	0.08-0.10	0.0-2.9	0.5-0.8	.10	.37			
	3-18	15-25	1.35-1.55	4.00-14.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.32			
	18-60	15-25	1.35-1.55	4.00-14.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.32			
5310: Jumble-----	0-1	12-18	0.30-0.50	14.00-100.00	0.18-0.28	---	60-85	---	---	5	8	0
	1-6	12-18	1.30-1.50	14.00-42.00	0.06-0.09	0.0-2.9	0.5-0.8	.10	.43			
	6-19	12-18	1.30-1.50	14.00-42.00	0.06-0.09	0.0-2.9	0.5-0.8	.02	.24			
	19-61	12-18	1.40-1.60	4.00-14.00	0.07-0.10	0.0-2.9	0.3-0.5	.05	.24			
Lemcave-----	0-1	10-18	0.30-0.50	10.00-705.00	0.20-0.28	---	60-85	---	---	5	8	0
	1-8	10-18	1.40-1.60	14.00-42.00	0.06-0.08	0.0-2.9	1.0-3.0	.05	.32			
	8-30	6-18	1.40-1.60	14.00-42.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.20			
	30-61	3-10	1.45-1.65	42.00-141.00	0.03-0.05	0.0-2.9	0.3-0.5	.02	.15			
5311: Jumble-----	0-1	12-18	0.30-0.50	14.00-100.00	0.18-0.28	---	60-85	---	---	5	8	0
	1-6	12-18	1.30-1.50	14.00-42.00	0.06-0.09	0.0-2.9	0.5-0.8	.10	.43			
	6-19	12-18	1.30-1.50	14.00-42.00	0.06-0.09	0.0-2.9	0.5-0.8	.02	.24			
	19-61	12-18	1.40-1.60	4.00-14.00	0.07-0.10	0.0-2.9	0.3-0.5	.05	.24			
Lemcave-----	0-1	10-18	0.30-0.50	10.00-705.00	0.20-0.28	---	60-85	---	---	5	8	0</

TABLE 23.--PHYSICAL PROPERTIES OF SOILS

Map symbol and soil name	Depth	Clay	Moist bulk density	Saturated Hydraulic Conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	um/sec	In/in	Pct	Pct					
Wheelerpek-----	0-4	12-18	1.25-1.40	14.00-42.00	0.07-0.09	0.0-2.9	0.5-0.8	.05	.32	1	8	0
	4-13	12-18	1.30-1.50	14.00-42.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.32			
	13-17	---	---	0.00-0.01	---	---	---	---	---			
Cobblywheel-----	0-2	---	0.20-0.40	4.00-14.00	0.20-0.30	---	50-80	---	---	5	8	0
	2-15	12-18	1.40-1.50	4.00-14.00	0.08-0.09	0.0-2.9	1.0-2.0	.10	.43			
	15-60	12-18	1.40-1.55	4.00-14.00	0.05-0.07	0.0-2.9	0.5-0.8	.02	.43			
5340: Linpeak-----	0-2	12-18	0.30-0.50	10.00-705.00	0.26-0.36	---	60-85	---	---	5	6	48
	2-3	12-18	1.20-1.30	14.00-42.00	0.11-0.13	0.0-2.9	1.0-2.0	.20	.37			
	3-14	12-18	1.20-1.30	14.00-42.00	0.09-0.11	0.0-2.9	1.0-2.0	.15	.37			
	14-32	18-24	1.25-1.35	4.00-14.00	0.07-0.09	0.0-2.9	0.5-0.8	.10	.37			
	32-62	5-15	1.30-1.40	4.00-14.00	0.06-0.08	0.0-2.9	0.3-0.5	.10	.37			
Piar-----	0-1	14-20	0.30-0.50	10.00-705.00	0.28-0.38	---	60-85	---	---	3	6	48
	1-3	14-20	1.25-1.35	14.00-42.00	0.07-0.09	0.0-2.9	0.5-0.8	.10	.32			
	3-13	14-20	1.35-1.50	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.10	.32			
	13-53	12-18	1.40-1.60	4.00-14.00	0.04-0.06	0.0-2.9	0.5-0.8	.10	.32			
	53-63	---	---	0.00-0.01	---	---	---	---	---			
Bricone-----	0-3	12-18	1.45-1.55	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.05	.37	1	6	48
	3-13	12-18	1.55-1.75	4.00-14.00	0.05-0.08	0.0-2.9	0.5-0.8	.05	.32			
	13-23	---	---	1.40-4.00	---	---	---	---	---			
5350: Goodski-----	0-4	10-18	1.25-1.40	14.00-42.00	0.06-0.13	0.0-2.9	2.0-4.0	.10	.32	2	7	38
	4-17	12-18	1.30-1.45	14.00-42.00	0.06-0.09	0.0-2.9	2.0-4.0	.05	.28			
	17-28	12-18	1.30-1.45	14.00-42.00	0.06-0.09	0.0-2.9	1.0-2.0	.05	.28			
	28-30	---	---	0.42-1.42	---	---	---	---	---			
	30-40	---	---	0.01-0.10	---	---	---	---	---			
Kious-----	0-9	3-8	1.20-1.35	4.00-14.00	0.06-0.08	0.0-2.9	2.0-4.0	.20	.32	2	6	48
	9-19	12-18	1.30-1.45	14.00-42.00	0.04-0.06	0.0-2.9	1.0-2.0	.05	.17			
	19-60	---	---	0.01-0.42	---	---	---	---	---			
Snacreek-----	0-1	12-18	0.30-0.50	10.00-705.00	0.20-0.29	---	60-85	---	---	5	6	48
	1-18	12-18	1.25-1.40	14.00-42.00	0.06-0.08	0.0-2.9	1.0-4.0	.05	.15			
	18-60	6-18	1.40-1.60	14.00-42.00	0.04-0.06	0.0-2.9	1.0-2.0	.02	.15			
5380: Ceebee-----	0-2	12-18	0.30-0.50	14.00-42.00	0.21-0.32	---	60-85	---	---	5	7	38
	2-10	12-18	1.25-1.40	14.00-42.00	0.08-0.10	0.0-2.9	1.0-4.0	.10	.37			
	10-24	3-10	1.30-1.45	42.00-141.00	0.03-0.05	0.0-2.9	0.1-0.5	.02	.15			
	24-62	6-12	1.35-1.55	14.00-42.00	0.10-0.13	0.0-2.9	0.1-0.5	.05	.20			
Strawbcrek-----	0-2	2-8	0.30-0.50	10.00-705.00	0.24-0.32	---	60-85	---	---	5	6	48
	2-3	2-8	1.25-1.35	14.00-42.00	0.10-0.12	0.0-2.9	1.0-2.0	.05	.15			
	3-26	2-8	1.30-1.45	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.05	.17			
	26-62	2-8	1.35-1.50	14.00-42.00	0.06-0.09	0.0-2.9	0.3-0.5	.05	.17			
5381: Ceebee-----	0-2	12-18	0.30-0.50	14.00-42.00	0.21-0.32	---	60-85	---	---	5	7	38
	2-10	12-18	1.25-1.40	14.00-42.00	0.08-0.10	0.0-2.9	1.0-4.0	.10	.37			
	10-24	3-10	1.30-1.45	42.00-141.00	0.03-0.05	0.0-2.9	0.1-0.5	.02	.15			
	24-62	6-12	1.35-1.55	14.00-42.00	0.10-0.13	0.0-2.9	0.1-0.5	.05	.20			
Pirapeak-----	0-1	12-18	0.30-0.50	10.00-705.00	0.20-0.28	---	60-85	---	---	5	8	0
	1-6	12-18	1.25-1.40	14.00-42.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.17			
	6-17	12-18	1.30-1.45	14.00-42.00	0.05-0.07	0.0-2.9	0.5-0.8	.05	.17			
	17-61	3-10	1.35-1.55	42.00-141.00	0.03-0.05	0.0-2.9	0.3-0.5	.02	.15			
5410: Timmercrek-----	0-1	16-24	0.30-0.50	10.00-705.00	0.20-0.30	---	60-85	---	---	5	7	38
	1-13	16-24	1.30-1.50	14.00-42.00	0.10-0.12	3.0-5.9	10-16	.15	.37			
	13-35	12-18	1.20-1.30	14.00-42.00	0.06-0.08	0.0-2.9	2.0-3.0	.10	.37			
	35-60	12-18	1.40-1.55	14.00-42.00	0.04-0.06	0.0-2.9	0.5-0.8	.02	.20			
5420: Topeki-----	0-12	18-25	1.30-1.45	4.00-14.00	0.07-0.09	0.0-2.9	2.0-4.0	.05	.32	1	8	0
	12-15	18-25	1.35-1.50	4.00-14.00	0.06-0.08	0.0-2.9	1.0-2.0	.05	.37			
	15-25	---	---	0.00-0.01	---	---	---	---	---			

TABLE 23.--PHYSICAL PROPERTIES OF SOILS

Map symbol and soil name	Depth	Clay	Moist bulk density	Saturated Hydraulic Conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	um/sec	In/in	Pct	Pct					
Badhap-----	0-3	18-27	1.15-1.35	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32	5	8	0
	3-44	18-27	1.20-1.40	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.10	.32			
	44-60	18-27	1.25-1.45	4.00-14.00	0.08-0.10	0.0-2.9	0.0-0.5	.10	.32			
Jonlake-----	0-14	18-25	1.25-1.40	4.00-14.00	0.08-0.10	0.0-2.9	1.0-2.0	.05	.37	1	8	0
	14-17	18-25	1.30-1.50	4.00-14.00	0.07-0.10	0.0-2.9	0.5-0.8	.05	.37			
	17-21	---	---	0.00-0.01	---	---	---	---	---			
5425: Ripcon-----	0-5	10-16	1.09-1.24	1.00-10.00	0.10-0.14	0.0-2.9	2.0-4.0	.17	.32	5	6	48
	5-15	10-16	1.17-1.37	1.00-10.00	0.04-0.10	0.0-2.9	1.0-3.0	.10	.32			
	15-62	12-18	1.24-1.45	10.00-100.00	0.04-0.06	0.0-2.9	1.0-3.0	.02	.20			
Bigwash-----	0-9	8-15	1.21-1.31	1.00-10.00	0.16-0.18	0.0-2.9	2.0-4.0	.28	.37	5	5	56
	9-60	12-18	1.20-1.40	1.00-10.00	0.11-0.18	0.0-2.9	1.0-3.0	.24	.32			
Glideski-----	0-4	14-18	1.02-1.26	14.00-42.00	0.10-0.14	0.0-2.9	2.0-4.0	.15	.32	5	6	48
	4-14	14-20	1.17-1.30	4.00-14.00	0.06-0.09	3.0-5.9	1.0-2.0	.10	.37			
	14-39	20-26	1.17-1.37	1.00-10.00	0.06-0.09	3.0-5.9	1.0-2.0	.05	.32			
	39-60	6-18	1.30-1.40	14.00-42.00	0.05-0.09	0.0-2.9	0.2-0.6	.05	.32			
5428: Rippo-----	0-6	8-14	0.40-0.80	10.00-100.00	0.35-0.45	---	50-70	---	---	5	7	38
	6-12	8-14	1.09-1.18	10.00-100.00	0.08-0.14	0.0-2.9	2.0-4.0	.10	.37			
	12-60	10-18	1.19-1.29	10.00-100.00	0.03-0.11	0.0-2.9	0.5-2.0	.02	.20			
Lehmandow-----	0-10	20-27	1.11-1.30	1.40-4.00	0.16-0.21	3.0-5.9	2.0-4.0	.32	.32	3	6	48
	10-60	20-35	1.40-1.60	0.01-0.10	0.09-0.14	3.0-5.9	0.5-1.0	.10	.43			
Brokit-----	0-16	12-20	1.20-1.35	4.00-14.00	0.09-0.11	0.0-2.9	2.0-4.0	.05	.28	5	7	38
	16-60	3-10	1.40-1.60	141.00-705.00	0.03-0.05	0.0-2.9	0.5-0.8	.02	.20			
5430: Brokit-----	0-16	12-20	1.20-1.35	4.00-14.00	0.09-0.11	0.0-2.9	10-15	.05	.28	5	7	38
	16-60	3-10	1.40-1.60	141.00-705.00	0.03-0.05	0.0-2.9	0.5-2.0	.02	.20			
5432: Glideski-----	0-4	14-18	1.02-1.26	14.00-42.00	0.10-0.14	0.0-2.9	2.0-4.0	.15	.32	5	6	48
	4-14	14-20	1.17-1.30	4.00-14.00	0.06-0.09	3.0-5.9	1.0-2.0	.10	.37			
	14-39	20-26	1.17-1.37	1.00-10.00	0.06-0.09	3.0-5.9	1.0-2.0	.05	.32			
	39-60	6-18	1.30-1.40	14.00-42.00	0.05-0.09	0.0-2.9	0.2-0.6	.05	.32			
Brokit-----	0-16	12-20	1.20-1.35	4.00-14.00	0.09-0.11	0.0-2.9	2.0-4.0	.05	.28	5	7	38
	16-60	3-10	1.40-1.60	141.00-705.00	0.03-0.05	0.0-2.9	0.5-0.8	.02	.20			
Lemcave-----	0-1	10-18	0.30-0.50	10.00-705.00	0.20-0.28	---	60-85	---	---	5	8	0
	1-8	10-18	1.40-1.60	14.00-42.00	0.06-0.08	0.0-2.9	1.0-3.0	.05	.32			
	8-30	6-18	1.40-1.60	14.00-42.00	0.06-0.08	0.0-2.9	0.5-0.8	.05	.20			
	30-61	3-10	1.45-1.65	42.00-141.00	0.03-0.05	0.0-2.9	0.3-0.5	.02	.15			
5434: Lehmandow-----	0-10	20-27	1.11-1.30	1.40-4.00	0.16-0.21	3.0-5.9	2.0-4.0	.32	.32	3	6	48
	10-60	20-35	1.40-1.60	0.01-0.10	0.09-0.14	3.0-5.9	0.5-1.0	.10	.43			
5440: Glaciers-----	---	---	---	---	---	---	---	---	---	-	---	---

TABLE 24.--CHEMICAL PROPERTIES OF SOILS

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
2103: Radol-----	0-2	9.6-24	---	7.9-9.0	5-20	1-5	0.0-4.0	0-3
	2-15	15-25	---	7.9-9.0	20-40	1-5	2.0-4.0	0-3
	15-25	---	---	---	---	---	---	---
Hyzen-----	0-2	5.0-20	---	7.9-8.4	20-35	0	0	0
	2-12	5.0-15	---	7.9-8.4	30-60	0	0	0
	12-16	---	---	---	---	---	---	---
Rock outcrop-----	---	---	---	---	---	---	---	---
2111: Garnel-----	0-7	8.0-15	---	6.1-7.3	0	0	0	0
	7-12	12-17	---	6.6-7.3	0	0	0	0
	12-20	---	---	---	---	---	---	---
Rock outcrop-----	---	---	---	---	---	---	---	---
2430: Bellenmine-----	0-5	10-20	---	6.1-7.3	0	0	0	0
	5-18	20-30	---	6.1-7.3	0	0	0	0
	18-28	---	---	---	---	---	---	---
Basinpeak-----	0-11	13-21	---	6.1-7.3	0	0	0	0
	11-60	11-16	---	6.1-7.8	0	0	0	0
2432: Majorsplace-----	0-7	17-20	---	6.6-9.0	0-10	0	0.0-2.0	0
	7-13	19-24	---	7.4-9.0	10-15	0	2.0-4.0	0
	13-18	13-17	---	8.5-9.6	15-25	0	4.0-8.0	0
	18-28	---	---	---	---	---	---	---
Checkett-----	0-3	15-25	---	7.4-9.0	0	0	0.0-4.0	0
	3-10	20-30	---	7.4-9.0	0	0	0.0-4.0	0
	10-17	15-30	---	7.4-9.0	5-10	0	0.0-4.0	0
	17-27	---	---	---	---	---	---	---
Grube-----	0-5	12-19	---	7.4-7.8	0	0	0	0
	5-11	12-19	---	7.4-7.8	0	0	0	0
	11-26	18-24	---	7.4-7.8	0	0	0	0
	26-39	18-24	---	7.9-8.4	5-20	0	0	1-5
	39-60	5.0-10	---	7.9-8.4	15-30	0	0	1-5
3344: Badena-----	0-12	8.0-13	---	6.6-7.8	0	0	0	0
	12-36	15-25	---	7.4-7.8	0	0	0	0
	36-60	5.0-10	---	7.4-7.8	0	0	0	0
Badena-----	0-12	8.0-13	---	6.6-7.8	0	0	0	0
	12-36	15-25	---	7.4-7.8	0	0	0	0
	36-60	5.0-10	---	7.4-7.8	0	0	0	0
3439: Eaglepass-----	0-2	5.0-15	---	7.9-9.0	15-30	0	0.0-2.0	0-5
	2-6	5.0-15	---	7.9-9.0	15-30	0	0.0-2.0	0-5
	6-16	---	---	---	---	---	---	---
Rock outcrop-----	---	---	---	---	---	---	---	---
Amtoft-----	0-6	10-20	---	7.4-9.0	10-20	---	0.0-2.0	0
	6-12	10-20	---	7.9-9.0	30-40	---	0.0-2.0	0
	12-16	---	---	---	---	---	---	0
3900: Osditch-----	0-1	73-92	---	6.1-6.5	0	0	0	0
	1-3	11-17	---	6.1-7.3	0	0	0	0
	3-18	9.0-16	---	6.1-7.3	0	0	0	0
	18-60	9.0-16	---	5.6-7.3	0	0	0	0

TABLE 24.--CHEMICAL PROPERTIES OF SOILS

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
4140:								
Lodari-----	0-3	10-20	---	7.4-8.4	25-35	0	0.0-2.0	0
	3-7	5.0-15	---	7.4-8.4	30-40	0	0.0-2.0	0
	7-19	5.0-15	---	7.9-9.0	40-60	0	0.0-2.0	0
	19-25	---	---	---	---	---	---	---
Monarch-----	0-6	8.0-15	---	7.9-8.4	5-15	0	0.0-2.0	0
	6-17	7.0-12	---	7.9-9.0	20-35	0	0.0-2.0	0
	17-27	---	---	---	---	---	---	---
Highup-----	0-10	14-22	---	7.4-9.0	20-35	0-1	0	0
	10-25	11-18	---	7.9-9.0	20-35	0-1	0	0
	25-35	---	---	---	---	---	---	---
4200:								
Wardbay-----	0-18	21-23	---	7.4-8.4	25-40	0	0	0
	18-42	17-21	---	7.9-8.4	25-40	0	0	0
	42-52	---	---	---	---	---	---	---
Haunchee-----	0-3	9.6-20	---	7.4-8.4	10-20	0	0	0
	3-15	8.1-17	---	7.9-9.0	30-50	0	0.0-2.0	1-12
	15-25	---	---	---	---	---	---	---
Muiral-----	0-2	75-100	---	5.6-6.0	0	0	0	0
	2-6	10-15	---	5.6-6.5	0	0	0	0
	6-39	10-15	---	6.1-8.4	0-5	0	0	0
	39-49	---	---	---	---	---	---	---
5100:								
Logring-----	0-3	5.0-15	---	7.4-9.0	15-40	0	0.0-4.0	0-5
	3-10	5.0-15	---	7.4-9.0	15-40	0	0.0-4.0	0-5
	10-20	---	---	---	---	---	---	---
Hyzen-----	0-2	5.0-20	---	7.9-8.4	20-35	0	0	0
	2-12	5.0-15	---	7.9-8.4	30-60	0	0	0
	12-16	---	---	---	---	---	---	---
Canyoung-----	0-12	9.0-17	---	7.4-8.4	5-10	0	0	0
	12-60	7.0-13	---	7.4-8.4	15-25	0	0	0
5102:								
Canyoung-----	0-12	9.0-17	---	7.4-8.4	5-10	0	0	0
	12-60	7.0-13	---	7.4-8.4	15-25	0	0	0
Zarark-----	0-4	8.8-16	---	7.4-8.4	10-15	0	0.0-2.0	0
	4-18	8.2-13	---	7.4-8.4	15-25	0	0.0-2.0	0
	18-28	5.1-10	---	7.4-8.4	25-45	0	0.0-2.0	0
	28-37	---	---	---	---	---	---	---
Wardbay-----	0-18	21-23	---	7.4-8.4	25-40	0	0	0
	18-42	17-21	---	7.9-8.4	25-40	0	0	0
	42-52	---	---	---	---	---	---	---
5110:								
Garnel-----	0-7	8.0-15	---	6.1-7.3	0	0	0	0
	7-12	12-17	---	6.6-7.3	0	0	0	0
	12-20	---	---	---	---	---	---	---
Garnel, very steep---	0-7	8.0-15	---	6.1-7.3	0	0	0	0
	7-12	12-17	---	6.6-7.3	0	0	0	0
	12-20	---	---	---	---	---	---	---
Rock outcrop-----	---	---	---	---	---	---	---	---
5140:								
Wardbay-----	0-18	21-23	---	7.4-8.4	25-40	0	0	0
	18-42	17-21	---	7.9-8.4	25-40	0	0	0
	42-52	---	---	---	---	---	---	---

TABLE 24.--CHEMICAL PROPERTIES OF SOILS

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
Canyoung-----	0-12	9.0-17	---	7.4-8.4	5-10	0	0	0
	12-60	7.0-13	---	7.4-8.4	15-25	0	0	0
Rock outcrop-----	---	---	---	---	---	---	---	---
5160:								
Hyzen-----	0-2	5.0-20	---	7.9-8.4	20-35	0	0	0
	2-12	5.0-15	---	7.9-8.4	30-60	0	0	0
	12-16	---	---	---	---	---	---	---
Rock outcrop-----	---	---	---	---	---	---	---	---
5210:								
Badhap-----	0-3	13-20	---	6.1-7.3	0	0	0	0
	3-44	13-20	---	6.1-7.3	0	0	0	0
	44-60	13-20	---	6.1-7.3	0	0	0	0
Badhap-----	0-3	13-20	---	6.1-7.3	0	0	0	0
	3-44	13-20	---	6.1-7.3	0	0	0	0
	44-60	13-20	---	6.1-7.3	0	0	0	0
Topeki-----	0-12	15-26	---	5.6-6.5	0	0	0	0
	12-15	13-22	---	5.6-6.5	0	0	0	0
	15-25	---	---	---	---	---	---	---
5220:								
Basinpeak-----	0-11	13-21	---	6.1-7.3	0	0	0	0
	11-60	11-16	---	6.1-7.8	0	0	0	0
Badhap-----	0-3	13-20	---	6.1-7.3	0	0	0	0
	3-44	13-20	---	6.1-7.3	0	0	0	0
	44-60	13-20	---	6.1-7.3	0	0	0	0
5240:								
Wardbay-----	0-18	21-23	---	7.4-8.4	25-40	0	0	0
	18-42	17-21	---	7.9-8.4	25-40	0	0	0
	42-52	---	---	---	---	---	---	---
Haunchee-----	0-3	9.6-20	---	7.4-8.4	10-20	0	0	0
	3-15	8.1-17	---	7.9-9.0	30-50	0	0.0-2.0	1-12
	15-25	---	---	---	---	---	---	---
Bakerpeak-----	0-1	73-92	---	6.1-7.3	0	0	0	0
	1-5	9.5-16	---	6.6-8.4	5-10	0	0.0-2.0	0
	5-13	11-16	---	6.6-8.4	10-15	0	0.0-2.0	0
	13-61	7.9-12	---	7.9-9.0	25-35	0	0.0-2.0	0
5241:								
Haunchee-----	0-3	9.6-20	---	7.4-8.4	10-20	0	0	0
	3-15	8.1-17	---	7.9-9.0	30-50	0	0.0-2.0	1-12
	15-25	---	---	---	---	---	---	---
Canyoung-----	0-12	9.0-17	---	7.4-8.4	5-10	0	0	0
	12-60	7.0-13	---	7.4-8.4	15-25	0	0	0
Rock outcrop-----	---	---	---	---	---	---	---	---
5250:								
Bricone-----	0-3	10-14	---	7.4-8.4	5-10	0	0	0
	3-13	10-14	---	7.4-8.4	10-15	0	0	0
	13-23	---	---	---	---	---	---	---
Piar-----	0-1	73-92	---	6.1-7.3	0-1	0	0	0
	1-3	8.0-14	---	6.6-7.8	5-15	0	0.0-2.0	0
	3-13	8.0-11	---	6.6-8.4	15-25	0	0.0-2.0	0
	13-53	6.5-10	---	7.9-8.4	25-35	0	0.0-2.0	0
	53-63	---	---	---	---	---	---	---

TABLE 24.--CHEMICAL PROPERTIES OF SOILS

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
5290:								
Keyole-----	0-1	73-92	---	6.6-7.3	0	0	0.0-2.0	0
	1-5	6.0-12	---	6.1-7.3	0	0	0	0
	5-18	6.0-12	---	6.1-7.3	0	0	0	0
	18-60	0.0-0.0	---	6.1-7.3	0	0	0	0
Osditch-----	0-1	73-92	---	6.1-6.5	0	0	0	0
	1-3	11-17	---	6.1-7.3	0	0	0	0
	3-18	9.0-16	---	6.1-7.3	0	0	0	0
	18-60	9.0-16	---	5.6-7.3	0	0	0	0
Topeki-----	0-12	15-26	---	5.6-6.5	0	0	0	0
	12-15	13-22	---	5.6-6.5	0	0	0	0
	15-25	---	---	---	---	---	---	---
5291:								
Keyole-----	0-1	73-92	---	6.6-7.3	0	0	0.0-2.0	0
	1-5	6.0-12	---	6.1-7.3	0	0	0	0
	5-18	6.0-12	---	6.1-7.3	0	0	0	0
	18-60	0.0-0.0	---	6.1-7.3	0	0	0	0
Rubble land-----	---	---	---	---	---	---	---	---
5292:								
Keyole-----	0-1	73-92	---	6.6-7.3	0	0	0.0-2.0	0
	1-5	6.0-12	---	6.1-7.3	0	0	0	0
	5-18	6.0-12	---	6.1-7.3	0	0	0	0
	18-60	0.0-0.0	---	6.1-7.3	0	0	0	0
Osditch-----	0-1	73-92	---	6.1-6.5	0	0	0	0
	1-3	11-17	---	6.1-7.3	0	0	0	0
	3-18	9.0-16	---	6.1-7.3	0	0	0	0
	18-60	9.0-16	---	5.6-7.3	0	0	0	0
5310:								
Jumble-----	0-1	73-92	---	5.6-6.5	0	0	0	0
	1-6	8.0-12	---	5.6-6.5	0	0	0	0
	6-19	8.0-12	---	5.1-6.5	0	0	0	0
	19-61	8.0-11	---	5.1-6.5	0	0	0	0
Lemcave-----	0-1	73-92	---	6.1-6.5	0	0	0	0
	1-8	8.0-17	---	6.1-7.3	0	0	0	0
	8-30	6.0-12	---	6.1-7.3	0	0	0	0
	30-61	1.0-6.0	---	5.1-6.5	0	0	0	0
5311:								
Jumble-----	0-1	73-92	---	5.6-6.5	0	0	0	0
	1-6	8.0-12	---	5.6-6.5	0	0	0	0
	6-19	8.0-12	---	5.1-6.5	0	0	0	0
	19-61	8.0-11	---	5.1-6.5	0	0	0	0
Lemcave-----	0-1	73-92	---	6.1-6.5	0	0	0	0
	1-8	8.0-17	---	6.1-7.3	0	0	0	0
	8-30	6.0-12	---	6.1-7.3	0	0	0	0
	30-61	1.0-6.0	---	5.1-6.5	0	0	0	0
Gaia-----	0-11	11-19	---	6.1-7.3	0	0	0	0
	11-60	5.0-12	---	6.1-7.3	0	0	0	0
5320:								
Wardbay-----	0-18	21-23	---	7.4-8.4	25-40	0	0	0
	18-42	17-21	---	7.9-8.4	25-40	0	0	0
	42-52	---	---	---	---	---	---	---
Wardbay, convex slopes-----	0-18	21-23	---	7.4-8.4	25-40	0	0	0
	18-42	17-21	---	7.9-8.4	25-40	0	0	0
	42-52	---	---	---	---	---	---	---
Basinpeak-----	0-11	13-21	---	6.1-7.3	0	0	0	0
	11-60	11-16	---	6.1-7.8	0	0	0	0

TABLE 24.--CHEMICAL PROPERTIES OF SOILS

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
5330:								
Rubble land-----	---	---	---	---	---	---	---	---
Wheelerpek-----	0-4	7.0-12	---	5.6-6.5	0	0	0	0
	4-13	7.0-12	---	5.6-6.5	0	0	0	0
	13-17	---	---	---	---	---	---	---
Cobblywheel-----	0-2	100-120	---	6.6-7.3	0	0	0	0
	2-15	7.3-9.6	---	6.6-7.3	0-1	0	0	0
	15-60	6.4-9.6	---	6.6-7.3	1-5	0	0.0-2.0	0
5340:								
Linpeak-----	0-2	73-92	---	5.6-6.5	0	0	0	0
	2-3	9.0-15	---	5.6-6.5	0	0	0	0
	3-14	9.0-15	---	5.6-7.3	0	0	0	0
	14-32	11-17	---	6.6-8.4	20-30	0	0	0
	32-62	11-16	---	7.4-8.4	25-40	0	0	0
Piar-----	0-1	73-92	---	6.1-7.3	0-1	0	0	0
	1-3	8.0-14	---	6.6-7.8	5-15	0	0.0-2.0	0
	3-13	8.0-11	---	6.6-8.4	15-25	0	0.0-2.0	0
	13-53	6.5-10	---	7.9-8.4	25-35	0	0.0-2.0	0
	53-63	---	---	---	---	---	---	---
Bricone-----	0-3	10-14	---	7.4-8.4	5-10	0	0	0
	3-13	10-14	---	7.4-8.4	10-15	0	0	0
	13-23	---	---	---	---	---	---	---
5350:								
Goodski-----	0-4	11-19	---	6.6-7.3	0	0	0	0
	4-17	10-17	---	6.6-7.3	0	0	0	0
	17-28	10-17	---	6.6-7.3	0	0	0	0
	28-30	---	---	---	---	---	---	---
	30-40	---	---	---	---	---	---	---
Kious-----	0-9	6.0-11	---	6.1-7.3	0	0	0	0
	9-19	8.0-11	---	6.1-7.3	0	0	0	0
	19-60	---	---	---	---	---	---	---
Snacreek-----	0-1	73-92	---	5.6-6.5	0	0	0	0
	1-18	11-19	---	5.6-6.5	0	0	0	0
	18-60	9.0-15	---	5.1-6.0	0	0	0	0
5380:								
Ceebee-----	0-2	---	37-77	5.1-6.0	0	0	0	0
	2-10	8.0-12	---	5.1-5.5	0	0	0	0
	10-24	1.0-6.0	---	4.5-6.0	0	0	0	0
	24-62	8.0-11	---	4.5-6.0	0	0	0	0
Strawbcrek-----	0-2	73-92	---	6.1-6.5	0	0	0	0
	2-3	9.0-15	---	6.1-6.5	0	0	0	0
	3-26	8.0-12	---	5.1-6.5	0	0	0	0
	26-62	8.0-11	---	5.1-6.0	0	0	0	0
5381:								
Ceebee-----	0-2	---	37-77	5.1-6.0	0	0	0	0
	2-10	8.0-12	---	5.1-5.5	0	0	0	0
	10-24	1.0-6.0	---	4.5-6.0	0	0	0	0
	24-62	8.0-11	---	4.5-6.0	0	0	0	0
Pirapeak-----	0-1	73-92	---	6.1-7.3	0	0	0	0
	1-6	7.0-13	---	6.1-7.3	0	0	0	0
	6-17	7.0-13	---	6.1-7.3	0	0	0	0
	17-61	1.0-6.0	---	6.1-7.3	0	0	0	0
5410:								
Timmercrek-----	0-1	73-92	---	6.6-7.3	0	0	0.0-2.0	0
	1-13	14-20	---	6.1-6.5	0	0	0.0-2.0	0
	13-35	12-20	---	5.6-6.5	0	0	0	0
	35-60	10-17	---	5.6-6.5	0	0	0	0

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

[illegible]

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Feet	Feet	Feet				
2430: Bellenmine-----	D	---	---	---	---	---	---	---	---
Basinpeak-----	B	---	---	---	---	---	---	---	---
2432: Majorsplace-----	D	---	---	---	---	---	---	---	---
Checkett-----	D	---	---	---	---	---	---	---	---
Grube-----	C	---	---	---	---	---	---	---	---
3344: Badena-----	B	---	---	---	---	---	---	---	---
Badena-----	B	---	---	---	---	---	---	---	---
3439: Eaglepass-----	D	---	---	---	---	---	---	---	---
Rock Outcrop-----	---	---	---	---	---	---	---	---	---
Amtoft-----	D	---	---	---	---	---	---	---	---
3900: Osditch-----	B	---	---	---	---	---	---	---	---
4140: Lodar-----	D	---	---	---	---	---	---	---	---
Monarch-----	D	---	---	---	---	---	---	---	---
Highup-----	C	---	---	---	---	---	---	---	---
4200: Wardbay-----	B	---	---	---	---	---	---	---	---
Haunchee-----	D	---	---	---	---	---	---	---	---
Muiral-----	C	---	---	---	---	---	---	---	---
5100: Logring-----	D	---	---	---	---	---	---	---	---
Hyzen-----	D	---	---	---	---	---	---	---	---
Canyoung-----	B	---	---	---	---	---	---	---	---
5102: Canyoung-----	B	---	---	---	---	---	---	---	---
Zarark-----	C	---	---	---	---	---	---	---	---

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Feet	Feet	Feet				
2430: Bellenmine-----	D	---	---	---	---	---	---	---	---
Basinpeak-----	B	---	---	---	---	---	---	---	---
2432: Majorsplace-----	D	---	---	---	---	---	---	---	---
Checkett-----	D	---	---	---	---	---	---	---	---
Grube-----	C	---	---	---	---	---	---	---	---
3344: Badena-----	B	---	---	---	---	---	---	---	---
Badena-----	B	---	---	---	---	---	---	---	---
3439: Eaglepass-----	D	---	---	---	---	---	---	---	---
Rock Outcrop-----	---	---	---	---	---	---	---	---	---
Amtoft-----	D	---	---	---	---	---	---	---	---
3900: Osditch-----	B	---	---	---	---	---	---	---	---
4140: Lodar-----	D	---	---	---	---	---	---	---	---
Monarch-----	D	---	---	---	---	---	---	---	---
Highup-----	C	---	---	---	---	---	---	---	---
4200: Wardbay-----	B	---	---	---	---	---	---	---	---
Haunchee-----	D	---	---	---	---	---	---	---	---
Muiral-----	C	---	---	---	---	---	---	---	---
5100: Logring-----	D	---	---	---	---	---	---	---	---
Hyzen-----	D	---	---	---	---	---	---	---	---
Canyoung-----	B	---	---	---	---	---	---	---	---
5102: Canyoung-----	B	---	---	---	---	---	---	---	---
Zarark-----	C	---	---	---	---	---	---	---	---

[illegible]

TABLE 25.-- WATER FEATURES--CONTINUED

[illegible]

[illegible]

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Feet	Feet	Feet				
5292: Keyole-----	A	---	---	---	---	---	---	---	---
Osditch-----	B	---	---	---	---	---	---	---	---
5310: Jumble-----	B	---	---	---	---	---	---	---	---
Lemcave-----	A	---	---	---	---	---	---	---	---
5311: Jumble-----	B	---	---	---	---	---	---	---	---
Lemcave-----	A	---	---	---	---	---	---	---	---
Gaia-----	A	---	---	---	---	---	---	---	---
5320: Wardbay-----	B	---	---	---	---	---	---	---	---
Wardbay, convex slopes-----	B	---	---	---	---	---	---	---	---
Basinpeak-----	B	---	---	---	---	---	---	---	---
5330: Rubble Land-----	---	---	---	---	---	---	---	---	---
Wheelerpek-----	D	---	---	---	---	---	---	---	---
Cobblywheel-----	B	---	---	---	---	---	---	---	---
5340: Linpeak-----	B	---	---	---	---	---	---	---	---
Piar-----	B	---	---	---	---	---	---	---	---
Bricone-----	D	---	---	---	---	---	---	---	---
5350: Goodski-----	B	---	---	---	---	---	---	---	---
Kious-----	D	---	---	---	---	---	---	---	---
Snacreek-----	A	---	---	---	---	---	---	---	---
5380: Ceebee-----	A	---	---	---	---	---	---	---	---
Strawbcrek-----	A	---	---	---	---	---	---	---	---

TABLE 25.-- WATER FEATURES--CONTINUED

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Feet	Feet	Feet				
5381: Ceebee-----	A	---	---	---	---	---	---	---	---
Pirapeak-----	A	---	---	---	---	---	---	---	---
5410: Timmercrek-----	A	---	---	---	---	---	---	---	---
5420: Topeki-----	D	---	---	---	---	---	---	---	---
Badhap-----	B	---	---	---	---	---	---	---	---
Jonlake-----	D	---	---	---	---	---	---	---	---
5425: Ripcon-----	C	March	---	---	---	---	None	Brief	Occasional
		April	2.6-3.3	5.6-5.6	---	---	None	Brief	Occasional
		May	2.6-3.3	5.6-5.6	---	---	None	Brief	Occasional
		June	2.6-3.3	5.6-5.6	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
Bigwash-----	B	February	---	---	---	---	None	Brief	Rare
		March	---	---	---	---	None	Brief	Rare
		April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
Glideski-----	B	---	---	---	---	---	---	---	---
5428: Rippo-----	A	March	---	---	---	---	None	Brief	Occasional
		April	---	---	---	---	None	Brief	Occasional
		May	---	---	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional

TABLE 25.-- WATER FEATURES--CONTINUED

Map symbol and soil name	Hydro- logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Feet	Feet	Feet				
Lehmandow-----	D	March	0.5-1.0	>6.0	---	---	None	Brief	Occasional
		April	0.5-1.0	>6.0	---	---	None	Brief	Occasional
		May	0.5-1.0	>6.0	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
Brokit-----	C	January	2.5-3.3	>6.0	---	---	None	---	---
		February	2.5-3.3	>6.0	---	---	None	---	---
		March	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		April	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		May	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		June	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
5430: Brokit-----	C	January	2.5-3.3	>6.0	---	---	None	---	---
		February	2.5-3.3	>6.0	---	---	None	---	---
		March	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		April	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		May	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		June	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
5432: Glideski-----	B	---	---	---	---	---	---	---	---
Brokit-----	C	January	2.5-3.3	>6.0	---	---	None	---	---
		February	2.5-3.3	>6.0	---	---	None	---	---
		March	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		April	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		May	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		June	2.5-3.3	>6.0	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
Lemcave-----	A	---	---	---	---	---	---	---	---
5434: Lehmandow-----	D	March	0.5-1.0	>6.0	---	---	None	Brief	Occasional
		April	0.5-1.0	>6.0	---	---	None	Brief	Occasional
		May	0.5-1.0	>6.0	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
5440: Glaciers-----	---	---	---	---	---	---	---	---	---

TABLE 26.--SOIL FEATURES

(See text for definitions of terms used in this table. Absence of an entry indicates that data were not populated. Components with no data in all columns will not display.)

Map symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
1650: Noski-----	Lithic bedrock	14-20	10-10	Indurated	Moderate	Moderate	Low
Cedarcabin-----	Paralithic bedrock	20-36	4-12	Moderately cemented	Moderate	Moderate	High
	Lithic bedrock	23-39	10-10	Indurated			
Noski-----	Lithic bedrock	14-20	10-10	Indurated	Moderate	Moderate	Low
1652: Noski-----	Lithic bedrock	14-20	10-10	Indurated	Moderate	Moderate	Low
Canyonfork-----	No restriction	---	---	---	Moderate	Moderate	Low
Cedarcabin-----	Paralithic bedrock	20-36	4-12	Moderately cemented	Moderate	Moderate	High
	Lithic bedrock	23-39	10-10	Indurated			
1700: Eenreed-----	No restriction	---	---	---	Moderate	High	Low
Millan-----	No restriction	---	---	---	Moderate	Moderate	Low
Eenreed-----	No restriction	---	---	---	Moderate	High	Low
1900: Borvant-----	Petrocalcic	10-20	6-20	Indurated	Moderate	High	Low
2000: Closkey-----	Paralithic bedrock	20-39	20-39	Moderately cemented	Moderate	Moderate	Low
2101: Radol-----	Lithic bedrock	14-20	10-10	Indurated	Moderate	Low	Low
Logring-----	Lithic bedrock	7-14	10-10	Indurated	Moderate	High	Low
2103: Radol-----	Lithic bedrock	14-20	10-10	Indurated	Moderate	Low	Low
Hyzen-----	Lithic bedrock	6-14	10-10	Indurated	Moderate	High	Low
2111: Garnel-----	Paralithic bedrock	10-14	6-39	Moderately cemented	Moderate	Moderate	Low
	Lithic bedrock	20-39	10-10	Indurated			
2430: Bellemine-----	Lithic bedrock	14-20	10-10	Indurated	Moderate	Moderate	Low
Basinpeak-----	No restriction	---	---	---	Moderate	Moderate	Low
2432: Majorsplace-----	Lithic bedrock	14-20	10-10	Indurated	Moderate	Low	Low
Checkett-----	Lithic bedrock	14-20	10-10	Indurated	Moderate	High	Moderate

TABLE 26.--SOIL FEATURES--CONTINUED

Map symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
Grube-----	No restriction	In ---	In ---	---	Moderate	Moderate	Low
3344: Badena-----	No restriction	---	---	---	Moderate	Moderate	Low
Badena-----	No restriction	---	---	---	Moderate	Moderate	Low
3439: Eaglepass-----	Lithic bedrock	4-6	10-10	Indurated	Moderate	High	Low
Amtoft-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	High	Moderate
3900: Osditch-----	No restriction	---	---	---	Moderate	Moderate	Moderate
4140: Lodar-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	High	Moderate
Monarch-----	Lithic bedrock	14-20	10-10	Indurated	Moderate	High	Low
Highup-----	Lithic bedrock	20-39	10-10	Indurated	Moderate	Moderate	Low
4200: Wardbay-----	Lithic bedrock	39-60	10-10	Indurated	Moderate	High	Low
Haunchee-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	High	Low
Muiral-----	Lithic bedrock	20-39	10-10	Indurated	Moderate	Moderate	Moderate
5100: Logring-----	Lithic bedrock	7-14	10-10	Indurated	Moderate	High	Low
Hyzen-----	Lithic bedrock	6-14	10-10	Indurated	Moderate	High	Low
Canyoung-----	No restriction	---	---	---	Moderate	High	Low
5102: Canyoung-----	No restriction	---	---	---	Moderate	High	Low
Zarark-----	Lithic bedrock	20-39	10-10	Indurated	Moderate	Low	Low
Wardbay-----	Lithic bedrock	39-60	10-10	Indurated	Moderate	High	Low
5110: Garnel-----	Paralithic bedrock	10-14	6-39	Moderately cemented	Moderate	Moderate	Low
	Lithic bedrock	20-39	10-10	Indurated			
Garnel, very steep-----	Paralithic bedrock	10-14	6-39	Moderately cemented	Moderate	Moderate	Low
	Lithic bedrock	20-39	10-10	Indurated			
5140: Wardbay-----	Lithic bedrock	39-60	10-10	Indurated	Moderate	High	Low
Canyoung-----	No restriction	---	---	---	Moderate	High	Low
5160: Hyzen-----	Lithic bedrock	6-14	10-10	Indurated	Moderate	High	Low

TABLE 26.--SOIL FEATURES--CONTINUED

Map symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
5210:		In	In				
Badhap-----	No restriction	---	---	---	Moderate	Moderate	Low
Badhap-----	No restriction	---	---	---	Moderate	Moderate	Low
Topeki-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	Moderate	Moderate
5220:							
Basinpeak-----	No restriction	---	---	---	Moderate	Moderate	Low
Badhap-----	No restriction	---	---	---	Moderate	Moderate	Low
5240:							
Wardbay-----	Lithic bedrock	39-60	10-10	Indurated	Moderate	High	Low
Haunchee-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	High	Low
Bakerpeak-----	No restriction	---	---	---	Moderate	High	Low
5241:							
Haunchee-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	High	Low
Canyoung-----	No restriction	---	---	---	Moderate	High	Low
5250:							
Bricone-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	High	Low
Piar-----	Lithic bedrock	39-59	10-10	Indurated	Moderate	High	Low
Linpeak-----	No restriction	---	---	---	Moderate	Moderate	Moderate
5251:							
Bricone-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	High	Low
Piar-----	Lithic bedrock	39-59	10-10	Indurated	Moderate	High	Low
5252:							
Bricone-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	High	Low
5253:							
Windwash-----	Lithic bedrock	20-39	10-10	Indurated	Moderate	Moderate	Low
Bricone-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	High	Low
5255:							
Wayhigh-----	Lithic bedrock	20-39	10-10	Indurated	Moderate	Low	Moderate
5261:							
Jonlake-----	Lithic bedrock	12-20	10-10	Indurated	Moderate	Moderate	Low
Badhap-----	No restriction	---	---	---	Moderate	Moderate	Low
Berrycreek-----	No restriction	---	---	---	Moderate	Moderate	Low
5270:							
Bakerpeak-----	No restriction	---	---	---	Moderate	High	Low
Canyoung-----	No restriction	---	---	---	Moderate	High	Low
5290:							

TABLE 26.--SOIL FEATURES--CONTINUED

Map symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
Keyole-----	No restriction	In ---	In ---	---	Moderate	Moderate	Low
Osditch-----	No restriction	---	---	---	Moderate	Moderate	Moderate
Topeki-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	Moderate	Moderate
5291: Keyole-----	No restriction	---	---	---	Moderate	Moderate	Low
5292: Keyole-----	No restriction	---	---	---	Moderate	Moderate	Low
Osditch-----	No restriction	---	---	---	Moderate	Moderate	Moderate
5310: Jumble-----	No restriction	---	---	---	Moderate	Moderate	Moderate
Lemcave-----	No restriction	---	---	---	Low	Moderate	Low
5311: Jumble-----	No restriction	---	---	---	Moderate	Moderate	Moderate
Lemcave-----	No restriction	---	---	---	Low	Moderate	Low
Gaia-----	No restriction	---	---	---	Moderate	Moderate	Low
5320: Wardbay-----	Lithic bedrock	39-60	10-10	Indurated	Moderate	High	Low
Wardbay, convex slopes-----	Lithic bedrock	39-60	10-10	Indurated	Moderate	High	Low
Basinpeak-----	No restriction	---	---	---	Moderate	Moderate	Low
5330: Wheelerpek-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	Moderate	Moderate
Cobblywheel-----	No restriction	---	---	---	Moderate	Moderate	Low
5340: Linpeak-----	No restriction	---	---	---	Moderate	Moderate	Moderate
Piar-----	Lithic bedrock	39-59	10-10	Indurated	Moderate	High	Low
Bricone-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	High	Low
5350: Goodski-----	Paralithic bedrock	20-37	1-2	Moderately cemented	Moderate	Low	Low
	Lithic bedrock	21-39	10-10	Indurated			
Kious-----	Paralithic bedrock	16-20	39-43	Moderately cemented	Moderate	Moderate	Low
Snacreek-----	No restriction	---	---	---	Moderate	Moderate	Moderate
5380: Ceebee-----	No restriction	---	---	---	Moderate	High	High
Strawberek-----	No restriction	---	---	---	Moderate	High	High

TABLE 26.--SOIL FEATURES--CONTINUED

Map symbol and soil name	Restrictive layer				Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
5381: Ceebee-----	No restriction	In ---	In ---	---	Moderate	High	High
Pirapeak-----	No restriction	---	---	---	Moderate	Moderate	Low
5410: Timmercrek-----	No restriction	---	---	---	Moderate	Moderate	Moderate
5420: Topeki-----	Lithic bedrock	10-20	10-10	Indurated	Moderate	Moderate	Moderate
Badhap-----	No restriction	---	---	---	Moderate	Moderate	Low
Jonlake-----	Lithic bedrock	12-20	10-10	Indurated	Moderate	Moderate	Low
5425: Ripcon-----	No restriction	---	---	---	Moderate	Moderate	Low
Bigwash-----	No restriction	---	---	---	Moderate	Low	Low
Glideski-----	No restriction	---	---	---	Moderate	Low	Low
5428: Rippo-----	No restriction	---	---	---	Moderate	Low	Low
Lehmandow-----	No restriction	---	---	---	High	High	Low
Brokit-----	No restriction	---	---	---	High	Moderate	Low
5430: Brokit-----	No restriction	---	---	---	High	Moderate	Low
5432: Glideski-----	No restriction	---	---	---	Moderate	Low	Low
Brokit-----	No restriction	---	---	---	High	Moderate	Low
Lemcave-----	No restriction	---	---	---	Low	Moderate	Low
5434: Lehmandow-----	No restriction	---	---	---	High	High	Low
5440: Glaciers-----	No restriction	---	---	---	High	---	---

TABLE 27.--TAXONOMIC CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Amtoft-----	Loamy-skeletal, carbonatic, mesic Lithic Xeric Haplocalcids
Badena-----	Loamy-skeletal, mixed, superactive, mesic Aridic Argixerolls
Badhap-----	Loamy-skeletal, mixed, superactive Pachic Haplocryolls
Bakerpeak-----	Loamy-skeletal, carbonatic Xeric Calcicryepts
Basinpeak-----	Loamy-skeletal, mixed, superactive Xeric Haplocryolls
Bellenmine-----	Loamy-skeletal, mixed, superactive, frigid Lithic Argixerolls
Berrycreek-----	Loamy-skeletal, mixed, superactive Xeric Haplocryolls
Bigwash-----	Coarse-loamy, mixed, superactive, frigid Cumulic Haploxerolls
Borvant-----	Loamy-skeletal, carbonatic, mesic, shallow Petrocalcic Palexerolls
Bricone-----	Loamy-skeletal, carbonatic Lithic Cryorthents
Brokit-----	Loamy-skeletal over sandy or sandy-skeletal, mixed, superactive Aquic Cumulic Haplocryolls
Canyonfork-----	Loamy-skeletal, carbonatic, frigid Typic Calcixerolls
Canyoung-----	Loamy-skeletal, carbonatic Xeric Calcicryolls
Cedarcabin-----	Loamy-skeletal, carbonatic, frigid Typic Calcixerolls
Ceebee-----	Sandy-skeletal, mixed Lamellic Haplocryalls
Checkett-----	Loamy-skeletal, mixed, superactive, mesic Lithic Xeric Haplargids
Closkey-----	Loamy-skeletal, mixed, superactive, frigid Aridic Argixerolls
Cobblywheel-----	Loamy-skeletal, mixed, active Xeric Haplocryolls
Eaglepass-----	Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents
Enreed-----	Loamy-skeletal, mixed, superactive, frigid Aridic Calcixerolls
Gaia-----	Loamy-skeletal, mixed, superactive Xeric Haplocryolls
Garnel-----	Loamy-skeletal, mixed, superactive, frigid, shallow Aridic Argixerolls
Glideski-----	Loamy-skeletal, mixed, superactive, frigid Typic Argixerolls
Goodski-----	Loamy-skeletal, mixed, superactive Pachic Haplocryolls
Grube-----	Loamy-skeletal, mixed, superactive, frigid Calciargidic Argixerolls
Haunchee-----	Loamy-skeletal, carbonatic Lithic Cryrendolls
Highup-----	Loamy-skeletal, carbonatic, frigid Typic Calcixerolls
Hyzen-----	Loamy-skeletal, carbonatic, frigid Lithic Haploxerolls
Jonlake-----	Loamy-skeletal, mixed, superactive Lithic Haplocryolls
Jumble-----	Loamy-skeletal, mixed, superactive Lamellic Dystrocryepts
Keyole-----	Loamy-skeletal, mixed, active Xeric Haplocryepts
Kious-----	Loamy-skeletal, mixed, superactive, shallow Pachic Haplocryolls
Lehmandow-----	Loamy-skeletal, mixed, superactive, frigid Typic Endoaquolls
Lemcave-----	Sandy-skeletal, mixed Oxyaquic Haplocryepts
Linpeak-----	Loamy-skeletal, carbonatic Xeric Calcicryepts
Lodar-----	Loamy-skeletal, carbonatic, mesic Lithic Calcixerolls
Logring-----	Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents
Majorsplace-----	Loamy-skeletal, mixed, superactive, frigid Lithic Argixerolls
Millan-----	Loamy-skeletal, mixed, superactive, frigid Aridic Argixerolls
Monarch-----	Loamy-skeletal, carbonatic, frigid Lithic Calcixerolls
Muiral-----	Loamy-skeletal, mixed, superactive Calcic Haplocryepts
Noski-----	Loamy-skeletal, carbonatic, frigid Lithic Calcixerolls
Osditch-----	Loamy-skeletal, mixed, superactive Lamellic Haplocryepts
Piar-----	Loamy-skeletal, carbonatic Xeric Calcicryepts
Pirapeak-----	Sandy-skeletal, mixed Xeric Haplocryepts
Radol-----	Loamy-skeletal, carbonatic, mesic Lithic Calcixerolls
Ripcon-----	Loamy-skeletal, mixed, superactive, frigid Cumulic Haploxerolls
Rippo-----	Loamy-skeletal, mixed, superactive, nonacid, frigid Mollic Xerofluvents
Snacreek-----	Loamy-skeletal, mixed, superactive Pachic Haplocryolls
Strawbcrek-----	Sandy-skeletal, mixed Lamellic Haplocryepts
Timmercrek-----	Loamy-skeletal, mixed, superactive Xeric Haplocryolls
Topeki-----	Loamy-skeletal, mixed, superactive Lithic Haplocryolls
Wardbay-----	Loamy-skeletal, carbonatic Pachic Calcicryolls
Wayhigh-----	Loamy-skeletal, mixed, superactive Xeric Haplocryepts
Wheelerpek-----	Loamy-skeletal, mixed, active, nonacid Lithic Cryorthents
Windwash-----	Loamy-skeletal, carbonatic Xeric Calcicryepts
Zarark-----	Loamy-skeletal, carbonatic Pachic Calcicryolls

APPENDIX 1.--INDEX OF COMMON NAMES, PLANT SYMBOL, AND SCIENTIFIC NAMES

Plants displayed occur within the National Soils Information System (NASIS) plant tables used for the soil survey area. The scientific and common names are referenced at the USDA PLANTS database: plants.usda.gov

Local Common Name	Plant Symbol	Scientific Name
alpine fescue	FEBR	<i>Festuca brachyphylla</i>
alpine timothy	PHAL2	<i>Phleum alpinum</i>
American red raspberry	RUID	<i>Rubus ideaus</i>
antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>
Baltic rush	JUBA	<i>Juncus balticus</i>
basin wildrye	LECI4	<i>Leymus cinereus</i>
beardless wildrye	LETR5	<i>Leymus triticoides</i>
black sagebrush	ARNO4	<i>Artemisia nova</i>
blue grama	BOGR2	<i>Bouteloua gracilis</i>
bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>
bluegrass	POA	<i>Poa</i> spp.
Booth's willow	SABO2	<i>Salix boothii</i>
bottlebrush squirreltail	ELEL5	<i>Elymus elymoides</i>
bristlecone pine	PIAR	<i>Pinus aristata</i>
clover	TRIFO	<i>Trifolium</i>
common juniper	JUCO6	<i>Juniperus communis</i>
cotoneaster	COTON	<i>Cotoneaster</i> spp.
cottonwood	POPUL	<i>Populus</i> spp.
curlleaf mountainmahogany	CELE3	<i>Cercocarpus ledifolius</i>
currant	RIBES	<i>Ribes</i>
cushion phlox	PHPU5	<i>Phlox pulvinata</i>
Douglas fir	PSME	<i>Pseudotsuga menziesii</i>
dunhead sedge	CAPH2	<i>Carex phaeocephala</i>
Engelmann's spruce	PIEN	<i>Picea engelmannii</i>
fourwing saltbush	ATCA2	<i>Atriplex canescens</i>
Fremont's cottonwood	POFR2	<i>Populus fremontii</i>
galleta	PLJA	<i>Pleuraphis jamesii</i>
golden willow	SAALV	<i>Salix alba</i> var. <i>vitellina</i>
gooseberry currant	RIMO2	<i>Ribes montigenum</i>
Great Basin bristlecone pine	PILO	<i>Pinus longaeva</i>
Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>
Kentucky bluegrass	POPR	<i>Poa pratensis</i>
Letterman needlegrass	ACLE9	<i>Achnatherum lettermanii</i>
limber pine	PIFL2	<i>Pinus flexilis</i>
littleleaf mountain mahogany	CEIN7	<i>Cercocarpus intricatus</i>
low sagebrush	ARAR8	<i>Artemisia arbuscula</i>
mountain big sagebrush	ARTRV	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
mountain brome	BRMA4	<i>Bromus marginatus</i>
mountain snowberry	SYOR2	<i>Symphoricarpos oreophilus</i>
muttongrass	POFE	<i>Poa fendleriana</i>
narrowleaf cottonwood	POAN3	<i>Populus angustifolia</i>
needleandthread	HECO26	<i>Hesperostipa comata</i>
needlegrass	ACHNA	<i>Achnatherum</i>
Nevada bluegrass	PONE3	<i>Poa secunda</i>
nodding brome	BRAN	<i>Bromus anomalus</i>
Oregongrape	MARE11	<i>Mahonia repens</i>
other perennial forbs	PPFF	
other perennial grasses	PPGG	
other shrubs	SSSS	
other trees	TTTT	
ponderosa pine	PIPOS	<i>Pinus ponderosa</i> var. <i>scopulorum</i>
Ponderosa pine	PIPOS	<i>Pinus ponderosa</i> var. <i>scopulorum</i>
quaking aspen	POTR5	<i>Populus tremuloides</i>
redosier dogwood	COSES	<i>Cornus sericea</i> ssp. <i>sericea</i>
Rocky Mountain Douglas fir	PSMEG	<i>Pseudotsuga menziesii</i> var. <i>glauca</i>
Ross' sedge	CARO5	<i>Carex rossii</i>
rush	JUNCU	<i>Juncus</i> spp.
Russian olive	ELAN	<i>Elaeagnus angustifolia</i>
sandbar willow	SAEX	<i>Salix exigua</i>
Sandberg bluegrass	POSE	<i>Poa secunda</i>
Scribner needlegrass	ACSC11	<i>Achnatherum scribneri</i>
sedge	CAREX	<i>Carex</i> spp.
Shrubby cinquefoil	DAFRF	<i>dasiphora fruticosa</i> ssp. <i>floribunda</i>
silver buffaloberry	SHAR	<i>Shepherdia argentea</i>
singleleaf pinyon	PIMO	<i>Pinus monophylla</i>
skunkbush sumac	RHTR	<i>Rhus trilobata</i>
skyline bluegrass	POCUE	<i>skyline bluegrass</i>
slender wheatgrass	ELTRT	<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>
snowberry	SYMPH	<i>Symphoricarpos</i> spp.
spiny greasewood	GLSPA	<i>Glossopetalon spinescens</i> var. <i>aridum</i>
Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>
Thurber needlegrass	ACTH7	<i>Achnatherum thurberianum</i>
timberline bluegrass	POGLR	<i>Poa glauca</i> ssp. <i>rupicola</i>
tufted hairgrass	DECE	<i>Deschampsia cespitosa</i>

APPENDIX 1.--INDEX OF COMMON NAMES, PLANT SYMBOL, AND SCIENTIFIC NAMES

Local Common Name	Plant Symbol	Scientific Name
Utah juniper	JUOS	<i>Juniperus osteosperma</i>
Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>
water birch	BEOC2	<i>Betula occidentalis</i>
Wheeler's bluegrass	POWH2	<i>Poa wheeleri</i>
white fir	ABCO	<i>Abies concolor</i>
whitestem goldenbush	ERDID	<i>Ericameria discoidea</i>
wild crab apple	PERA4	<i>Peraphyllum ramosissimum</i>
willow	SALIX	<i>Salix</i> spp.
Woods' rose	ROWO	<i>Rosa woodsii</i>
Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>

APPENDIX 2--INDEX OF PLANT SYMBOLS, COMMON NAMES, AND SCIENTIFIC NAMES

Plants displayed occur within the National Soils Information System (NASIS) plant tables used for the soil survey area. The scientific and common names are referenced at the USDA PLANTS database: plants.usda.gov

Plant Symbol	Local Common Name	Scientific Name
ABCO	white fir	<i>Abies concolor</i>
ACHNA	needlegrass	<i>Achnatherum</i>
ACHY	Indian ricegrass	<i>Achnatherum hymenoides</i>
ACLE9	Letterman needlegrass	<i>Achnatherum lettermanii</i>
ACSC11	Scribner needlegrass	<i>Achnatherum scribneri</i>
ACTH7	Thurber needlegrass	<i>Achnatherum thurberianum</i>
AMUT	Utah serviceberry	<i>Amelanchier utahensis</i>
ARAR8	low sagebrush	<i>Artemisia arbuscula</i>
ARNO4	black sagebrush	<i>Artemisia nova</i>
ARTRV	mountain big sagebrush	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
ARTRW8	Wyoming big sagebrush	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>
ATCA2	fourwing saltbush	<i>Atriplex canescens</i>
BEOC2	water birch	<i>Betula occidentalis</i>
BOGR2	blue grama	<i>Bouteloua gracilis</i>
BRAN	nodding brome	<i>Bromus anomalus</i>
BRMA4	mountain brome	<i>Bromus marginatus</i>
CAPH2	dunhead sedge	<i>Carex phaeocephala</i>
CAREX	sedge	<i>Carex</i> spp.
CAR05	Ross' sedge	<i>Carex rossii</i>
CEIN7	littleleaf mountain mahogany	<i>Cercocarpus intricatus</i>
CELE3	curlleaf mountainmahogany	<i>Cercocarpus ledifolius</i>
COSES	redosier dogwood	<i>Cornus sericea</i> ssp. <i>sericea</i>
COTON	cotoneaster	<i>Cotoneaster</i> spp.
DAFRF	Shrubby cinquefoil	<i>Dasiphora fruticosa</i> ssp. <i>floribunda</i>
DECE	tufted hairgrass	<i>Deschampsia cespitosa</i>
ELAN	Russian olive	<i>Elaeagnus angustifolia</i>
ELEL5	bottlebrush squirreltail	<i>Elymus elymoides</i>
ELTRT	slender wheatgrass	<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>
ERDID	whitestem goldenbush	<i>Ericameria discoidea</i>
FEBR	alpine fescue	<i>Festuca brachyphylla</i>
GLSPA	spiny greasewood	<i>Glossopetalon spinescens</i> var. <i>aridum</i>
HECO26	needleandthread	<i>Hesperostipa comata</i>
JUBA	Baltic rush	<i>Juncus balticus</i>
JUCO6	common juniper	<i>Juniperus communis</i>
JUNCU	rush	<i>Juncus</i> spp.
JUOS	Utah juniper	<i>Juniperus osteosperma</i>
LECI4	basin wildrye	<i>Leymus cinereus</i>
LETR5	beardless wildrye	<i>Leymus triticoides</i>
MARE11	Oregongrape	<i>Mahonia repens</i>
PERA4	wild crab apple	<i>Peraphyllum ramosissimum</i>
PHAL2	alpine timothy	<i>Phleum alpinum</i>
PHPU5	cushion phlox	<i>Phlox pulvinata</i>
PIAR	bristlecone pine	<i>Pinus aristata</i>
PIEN	Engelmann's spruce	<i>Picea engelmannii</i>
PIFL2	limber pine	<i>Pinus flexilis</i>
PILO	Great Basin bristlecone pine	<i>Pinus longaeva</i>
PIMO	singleleaf pinyon	<i>Pinus monophylla</i>
PIPOS	ponderosa pine	<i>Pinus ponderosa</i> var. <i>scopulorum</i>
PLJA	galleta	<i>Pleuraphis jamesii</i>
POA	bluegrass	<i>Poa</i> spp.
POAN3	narrowleaf cottonwood	<i>Populus angustifolia</i>
POCUE	skyline bluegrass	<i>Populus glauca</i> ssp. <i>rupicola</i>
POFE	muttongrass	<i>Poa fendleriana</i>
POFR2	Fremont's cottonwood	<i>Populus fremontii</i>
POGLR	timberline bluegrass	<i>Poa glauca</i> ssp. <i>rupicola</i>
PONE3	Nevada bluegrass	<i>Poa secunda</i>
POPR	Kentucky bluegrass	<i>Poa pratensis</i>
POPUL	cottonwood	<i>Populus</i> spp.
POSE	Sandberg bluegrass	<i>Poa secunda</i>
POTR5	quaking aspen	<i>Populus tremuloides</i>
POWH2	Wheeler's bluegrass	<i>Poa wheeleri</i>
PPFF	other perennial forbs	
PPGG	other perennial grasses	
PSME	Douglas fir	<i>Pseudotsuga menziesii</i>
PSMEG	Rocky Mountain Douglas fir	<i>Pseudotsuga menziesii</i> var. <i>glauca</i>
PSP6	bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>
PUST	Stansbury cliffrose	<i>Purshia stansburiana</i>
PUTR2	antelope bitterbrush	<i>Purshia tridentata</i>
RHTR	skunkbush sumac	<i>Rhus trilobata</i>
RIBES	currant	<i>Ribes</i>
RIMO2	gooseberry currant	<i>Ribes montigenum</i>
ROWO	Woods' rose	<i>Rosa woodsii</i>
RUID	American red raspberry	<i>Rubus ideaus</i>
SAALV	golden willow	<i>Salix alba</i> var. <i>vitellina</i>

APPENDIX 2--INDEX OF PLANT SYMBOLS, COMMON NAMES, AND SCIENTIFIC NAMES

Plant Symbol	Local Common Name	Scientific Name
SABO2	Booth's willow	Salix boothii
SAEX	sandbar willow	Salix exigua
SALIX	willow	Salix spp.
SHAR	silver buffaloberry	Shepherdia argentea
SSSS	other shrubs	
SYMPH	snowberry	Symphoricarpos spp.
SYOR2	mountain snowberry	Symphoricarpos oreophilus
TRIFO	clover	Trifolium
TTTT	other trees	

APPENDIX 3--CLASSIFICATION OF PEDONS SAMPLED FOR LABORATORY ANALYSIS

Sample ID	Lab Pedon ID	Correlated Name	Map Unit	Notes
91NV033001	92P0143	Linpeak	5430	Type location for series
91NV033002	92P0144	Snacreek	5350	Type location for series
91NV033003	92P0145	Ceebee	5381	Type location for series
91NV033004	92P0146	Timmercreek	5410	Type location for series
91NV033005	92P0147	Strawbcreek	5380	Type location for series
91NV033006	92P0148	Snacreek taxadjunct	5350	Typic Haplocryolls
91NV033007	92P0149	Ceebee	5381	In range of series
91NV033008	92P0150	Brokit	5430	Type location for series

Taxonomic Classification of sampled pedons:

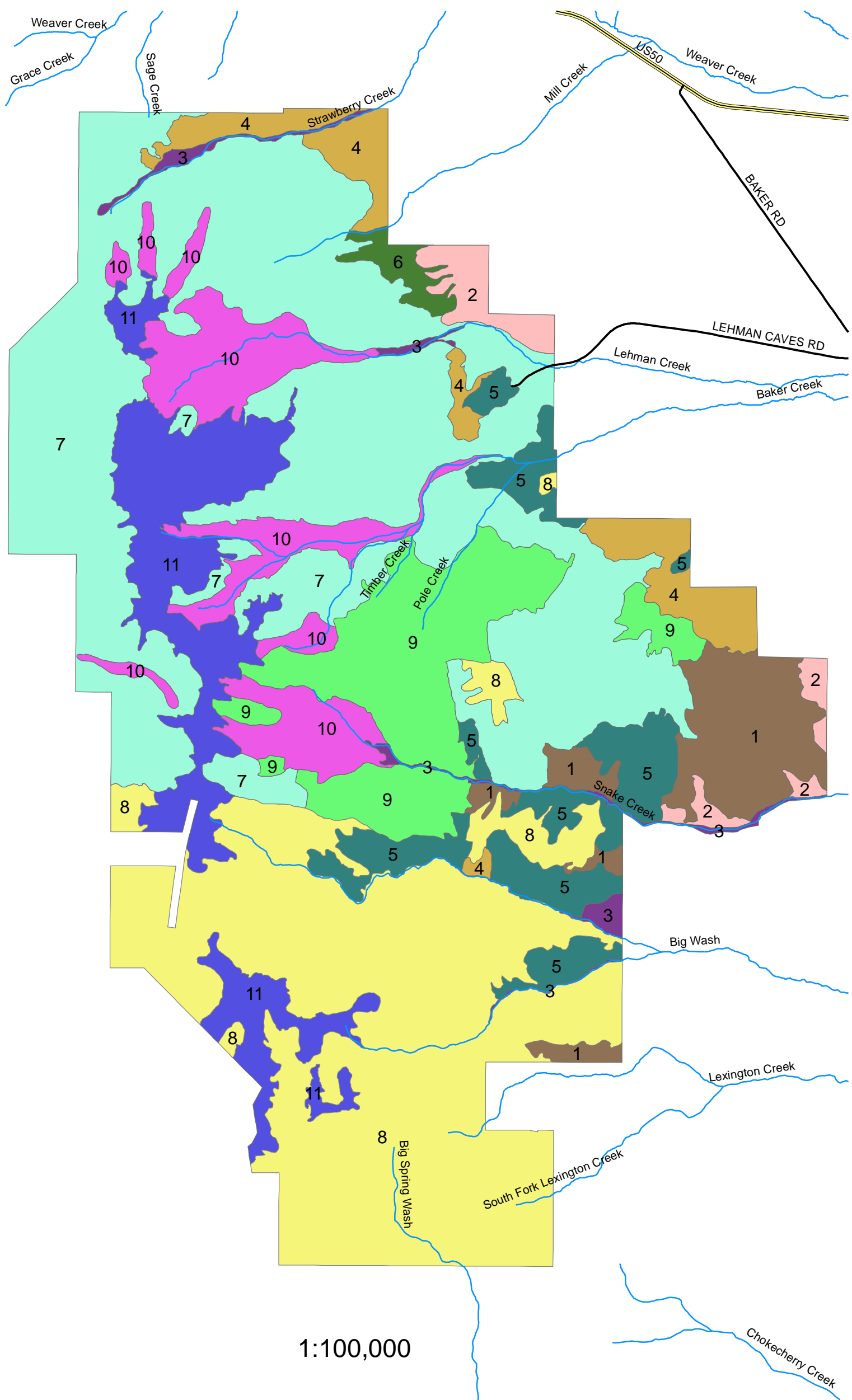
91NV033001: Linpeak; Loamy-skeletal, carbonatic Xeric Calcicryept
 91NV033002: Snacreek; Loamy-skeletal, mixed, superactive Pachic Haplocryolls
 91NV033003: Ceebee; Sandy-skeletal, mixed, Lamellic Haplocryalf
 91NV033004: Timmercreek; Loamy-skeletal, mixed, superactive Xeric Haplocryolls
 91NV033005: Strawbcreek; Sandy-skeletal, mixed Lamellic Haplocryepts
 91NV033006: Snacreek taxadjunct; Loamy-skeletal, mixed, superactive Typic Haplocryolls
 91NV033007: Ceebee; Sandy-skeletal, mixed, Lamellic Haplocryalf
 91NV033008: Brokit; Loamy-skeletal over sandy or sandy-skeletal, mixed superactive, Aquic Cumulic Haplocryoll

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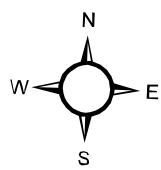
Great Basin National Park, Nevada

General Soil Map



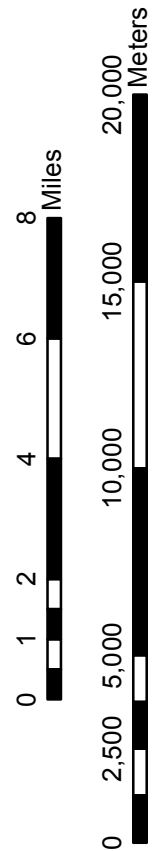
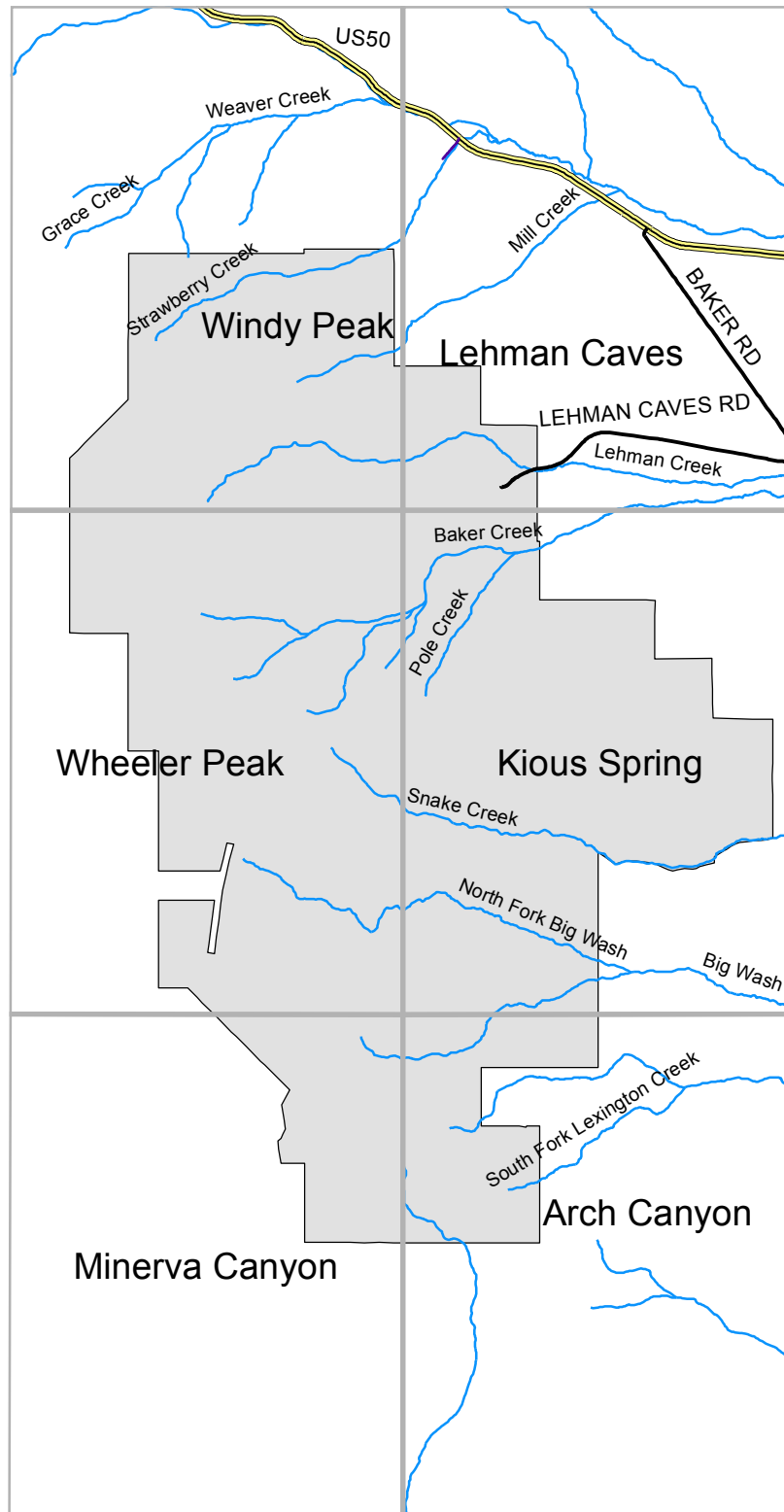
Legend

- 1** Lithic Calcixerolls-Lithic Haploxerolls-Rock outcrop
Shallow, well drained, mesic soils formed in residuum from limestone on low elevation hills and mountains.
Vegetation consists mainly of black sagebrush, Utah juniper, singleleaf pinyon and curleaf mountainmahogany.
- 2** Petrocalcic Palexerolls-Aridic Calcixerolls-Aridic Argixerolls
Shallow and very deep, well drained mesic soils formed in alluvium dominantly from limestone on low elevation fan piedmonts, low hills and mountains.
Vegetation consists of black sagebrush, Wyoming big sagebrush, and Utah juniper.
- 3** Typic Argixerolls-Aquic Cumulic Haplocryolls-Oxyaquic Haplocryepts
Shallow to very deep, well drained, frigid and cryic soils formed in alluvium and glacial till from limestone and quartzite on middle elevation fan piedmonts and mountains.
Vegetation consists of basin big sagebrush, black sagebrush, Utah juniper, and singleleaf pinyon.
- 4** Aridic Argixerolls-Rock outcrop
Shallow to very deep, well drained frigid soils formed in residuum and colluvium from granite on middle elevation hills and mountains.
Vegetation consists of mountain big sagebrush, Utah juniper, singleleaf pinyon and white fir.
- 5** Lithic Xeric Torriorthents-Lithic Calcixerolls-Lithic Haploxerolls
Shallow to moderately deep, well drained frigid and mesic soils formed in residuum and colluvium from limestone on middle elevation hills and mountains.
Vegetation consists of curleaf mountainmahogany, Utah juniper, and singleleaf pinyon.
- 6** Lithic Argixerolls-Xeric Haplocryolls
Shallow and very deep, well drained, frigid and cryic soils formed in residuum and colluvium from quartzite on middle elevation hills and mountains.
Vegetation consists of black sagebrush, mountain big sagebrush, Utah juniper, singleleaf pinyon and curleaf mountainmahogany.
- 7** Xeric Haplocryepts- Lamellic Haplocryepts-Pachic Haplocryolls
Shallow to very deep, well drained, cryic soils formed in residuum and colluvium from quartzite on high elevation mountains.
Vegetation consists of low sagebrush, curleaf mountainmahogany, mountain big sagebrush, quaking aspen, white fir, and Engelmann's spruce.
- 8** Lithic Cryorthents-Xeric Calcicryolls- Xeric Calcicryepts
Shallow to very deep, well drained, cryic soils formed in residuum and colluvium from limestone on high elevation mountains.
Vegetation consists of, mountain big sagebrush, curleaf mountainmahogany, quaking aspen, white fir, bristlecone pine, and Engelmann's spruce.
- 9** Pachic Haplocryolls-Lamellic Haplocryalls-Pachic Haplocryolls
Shallow to very deep, well drained, cryic soils formed in residuum and colluvium from granite on high elevation mountains.
Vegetation consists of, mountain big sagebrush, curleaf mountainmahogany, quaking aspen, and Engelmann's spruce.
- 10** Lamellic Dystrocryepts-Oxyaquic Haplocryepts-Xeric Haplocryolls
Very deep, well drained, cryic soils formed in glacial till dominantly from quartzite on high elevation moraines on mountains.
Vegetation consists of, mountain big sagebrush, quaking aspen, and Engelmann's spruce.
- 11** Rubble land-Lithic Cryorthents-Xeric Haplocryolls
Shallow to very deep, well drained, cryic soils formed in residuum and colluvium from quartzite and limestone on high elevation mountains.
Vegetation consists of alpine tundra community.



INDEX TO MAP SHEETS

GREAT BASIN NATIONAL PARK, NEVADA



GREAT BASIN NATIONAL PARK, NEVADA

SOIL LEGEND

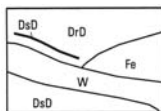
<u>Symbol</u>	<u>Name</u>
1650	Noski-Cedarcabin association
1652	Noski-Canyonfork-Cedarcabin association
1700	Eenreed-Millan association
1900	Borvant extremely gravelly loam, 4 to 30 percent slopes
2000	Closkey very gravelly loamy coarse sand, 4 to 30 percent slopes
2101	Radol-Logring-Rock outcrop association
2103	Radol-Hyzen-Rock outcrop association
2111	Garnel-Rock outcrop association
2430	Bellenmine-Basinpeak association
2432	Majorsplace-Checkett-Grube association
3344	Badena association
3439	Eaglepass-Rock outcrop-Amtoft association
3900	Osditch extremely stony loam, 30 to 75 percent slopes
4140	Lodar-Monarch-Highup association
4200	Wardbay-Haunchee-Muiral association
5100	Logring-Hyzen-Canyoung association
5102	Canyoung-Zarark-Wardbay association
5110	Garnel-Garnel, very steep-Rock outcrop association
5140	Wardbay-Canyoung-Rock outcrop association
5160	Hyzen-Rock outcrop association
5210	Badhap-Topeki association
5220	Basinpeak-Badhapp association
5240	Wardbay-Haunchee-Bakerpeak association
5241	Haunchee-Canyoung-Rock outcrop association
5250	Bricone-Piar-Linpeak association
5251	Bricone-Piar-Rock outcrop association
5252	Bricone-Rock outcrop association, steep
5253	Windwash-Bricone-Rock outcrop association
5255	Wayhigh very gravelly fine sandy loam, 2 to 15 percent slopes
5261	Jonlake-Badhapp-Berrycreek association
5270	Bakerpeak-Canyoung-Rock outcrop association
5290	Keyole-Osditch-Topeki association
5291	Keyole-Rubble land association
5292	Keyole-Osditch association
5310	Jumble-Lemcave association
5311	Jumble-Lemcave-Gaia association
5320	Wardbay-Basinpeak association
5330	Rubble land-Wheelerpek-Cobblywheel association
5340	Linpeak-Piar-Bricone association
5350	Goodski-Kious-Snacreek association
5380	Ceebee-Strawbcrek association
5381	Ceebee-Pirapeak association
5410	Timmercrek very gravelly highly organic loam, 15 to 50 percent slopes
5420	Topeki-Badhapp-Jonlake association
5425	Ripcon-Bigwash-Glideski association
5428	Rippo-Lehmandow-Brokit association
5430	Brokit very stony highly organic loam, 8 to 15 percent slopes
5432	Glideski- Brokit-Lemcave association
5434	Lehmandow loam, 2 to 8 percent slopes
5440	Glaciers

GREAT BASIN NATIONAL PARK, NEVADA

FEATURE AND SYMBOL LEGEND FOR SOIL SURVEY

SOIL SURVEY FEATURES

SOIL
DELINEATIONS
AND LABELS



STANDARD LANDFORM AND
MISCELLANEOUS SURFACE
FEATURES

Bedrock escarpment	YAYAYAYAYAYAYAY
Non-bedrock escarpment	AYAYAYAYAYAYAY
Gully	~~~~~
Levee	
Short steep slope
Blowout	⊙
Borrow pit	⊗
Clay spot	⊛
Closed depression	◆
Gravel pit	⊗
Gravelly spot	⊙
Landfill	⊙
Lava flow	▲
Marsh or swamp	⊙
Mine or quarry	⊗
Miscellaneous water	⊙
Perennial water	⊙
Rock outcrop	⊙
Saline spot	+
Sandy spot	⊗
Severely eroded spot	⊙
Sinkhole	⊙
Slide or slip	⊙
Sodic spot	⊙
Spoil area	⊙
Stony spot	⊙
Vary stony spot	⊙
Wet spot	⊙

CULTURAL FEATURES

National, state or providence County or parish County or parish Reservation (national or state forest or park)	— — — — —
Limit of soil survey (label) and/or denied access area	— — — — —
Field sheet matchline and neatline	— — — — —
Public Land Survey System Section Boundary	— — — — —
Public Land Survey System Section Corner Tics.	⊥ ⊥ ⊥

ROAD EMBLEMS

Interstate	⬢
Federal	⬢
State	⬢
County, farm or ranch	⬢

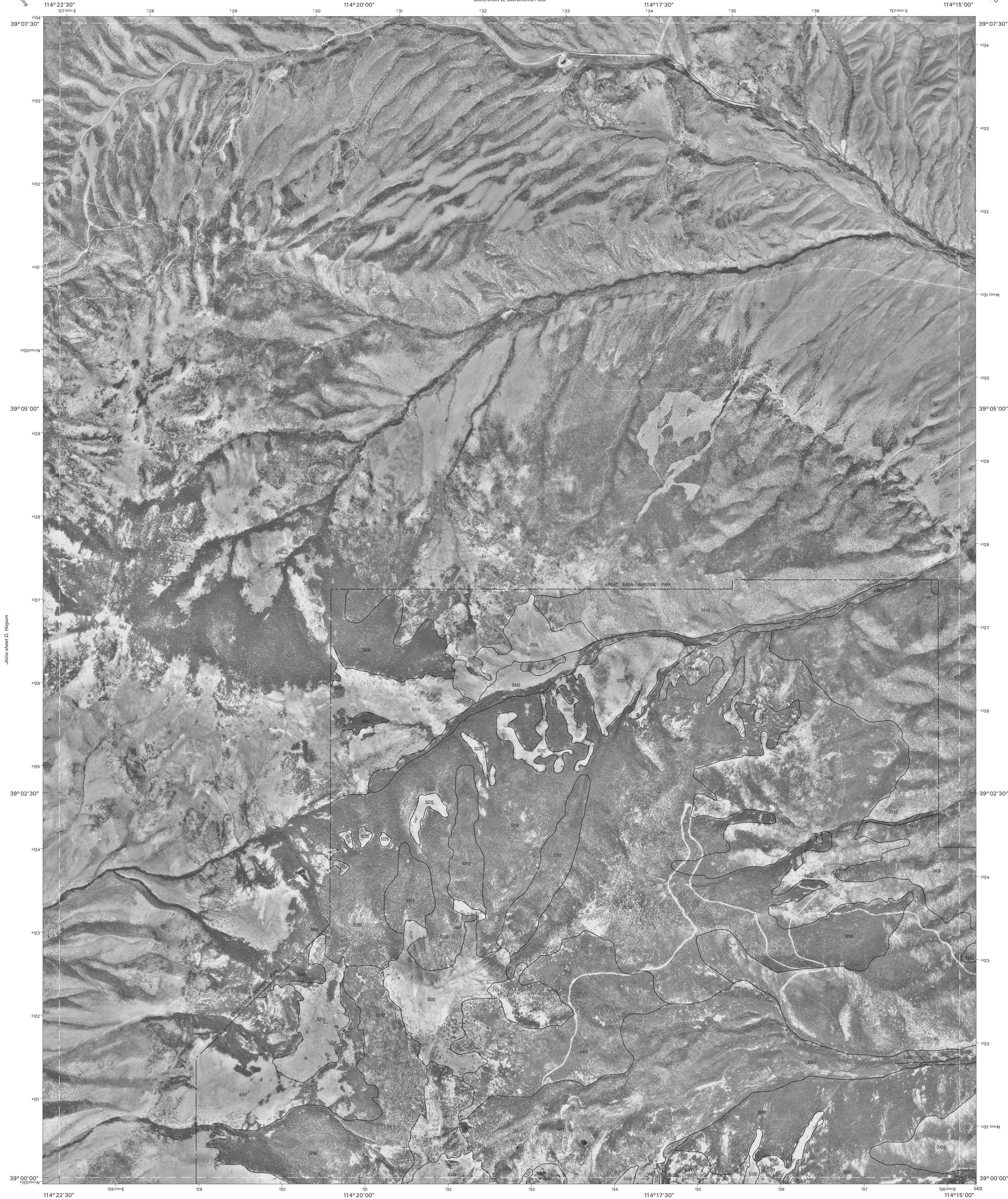
Joins sheet A,
South Bastian Spring

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

GREAT BASIN NATIONAL PARK, NEVADA
WINDY PEAK QUADRANGLE
SHEET NUMBER 1 OF 6

Joins sheet C,
Old Mans Canyon

Joins sheet B, Sacramento Pass



Joins sheet E,
Baking Powder Flat

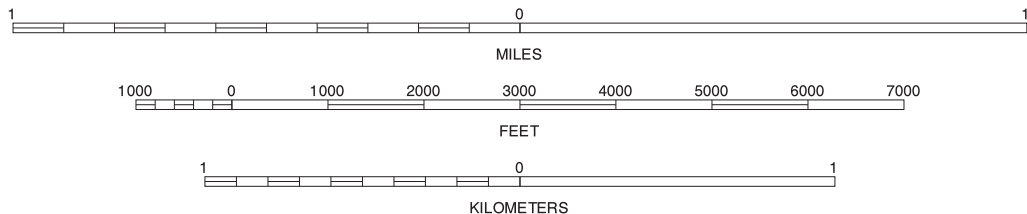
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1999 aerial photography.

North American Datum of 1983 (NAD83), GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 11.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



A	B	C
D	2	
E	3	4

INDEX TO ADJOINING 7.5 MAPS

A SOUTH BASTIAN SPRING
B SACRAMENTO PASS
C OLD MANS CANYON
D HOGUM
E LEHMAN CAVES
F BAKING POWDER FLAT
G WHEELER PEAK
H KIOUS SPRING

WINDY PEAK, NEVADA
7.5 MINUTE SERIES
SHEET NUMBER 1 OF 6

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.

Joins sheet A,
Kious Spring

Joins sheet A,
Sacramento Pass

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

GREAT BASIN NATIONAL PARK, NEVADA
LEHMAN CAVES QUADRANGLE
SHEET NUMBER 2 OF 6

Joins sheet C,
The Cove

Joins sheet B, Old Mans Canyon



Joins sheet 1, Windy Peak

Joins sheet D, Baker

Joins sheet 3,
Windy Peak

Joins sheet E,
Garrison

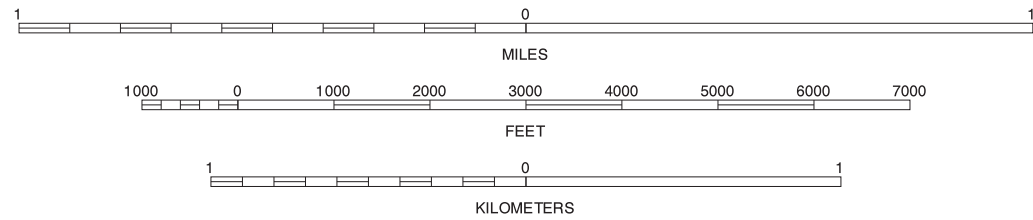
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1999 aerial photography.

North American Datum of 1983 (NAD83), GRS-80 Spheroid
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NORTH



QUADRANGLE LOCATION



A	B	C
1		D
3	4	E

INDEX TO ADJOINING 7.5 MAPS

LEHMAN CAVES, NEVADA
7.5 MINUTE SERIES
SHEET NUMBER 2 OF 6

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.



Joins sheet B, Baking Powder Flat

Joins sheet 4, Klaus Spring

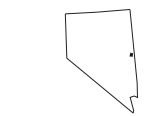
Joins sheet C, Minerva

Joins sheet 6, Arch Canyon

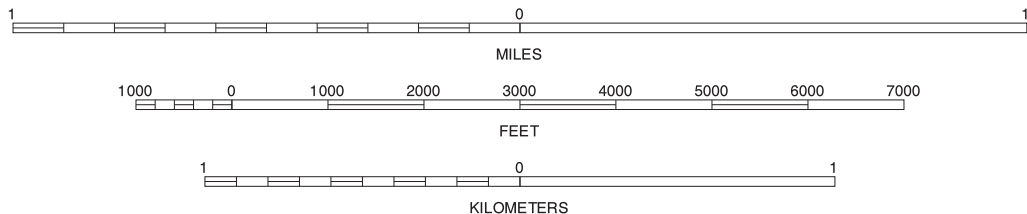
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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 11. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION



A	1	2
B	3	4
C	5	6

INDEX TO ADJOINING 7.5 MAPS

A HOGUM
1 WINDY PEAK
2 LEHMAN CAVES
3 BAKING POWDER FLAT
4 KLOUS SPRING
5 MINERVA
6 MINERVA CANYON
7 ARCH CANYON

WHEELER PEAK, NEVADA
7.5 MINUTE SERIES
SHEET NUMBER 3 OF 6

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

Joins sheet 2, Lehman Caves

Joins sheet A,
Baker



Joins sheet 3, Wheeler Peak

Joins sheet B, Garrison

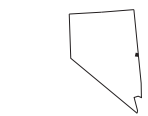
Joins sheet 5,
Minerva Canyon

Joins sheet C,
Wheeler Peak Spring

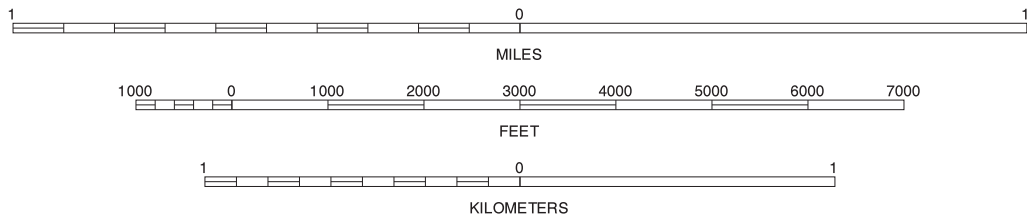
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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 11.
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NORTH



QUADRANGLE LOCATION



SCALE 1:24000

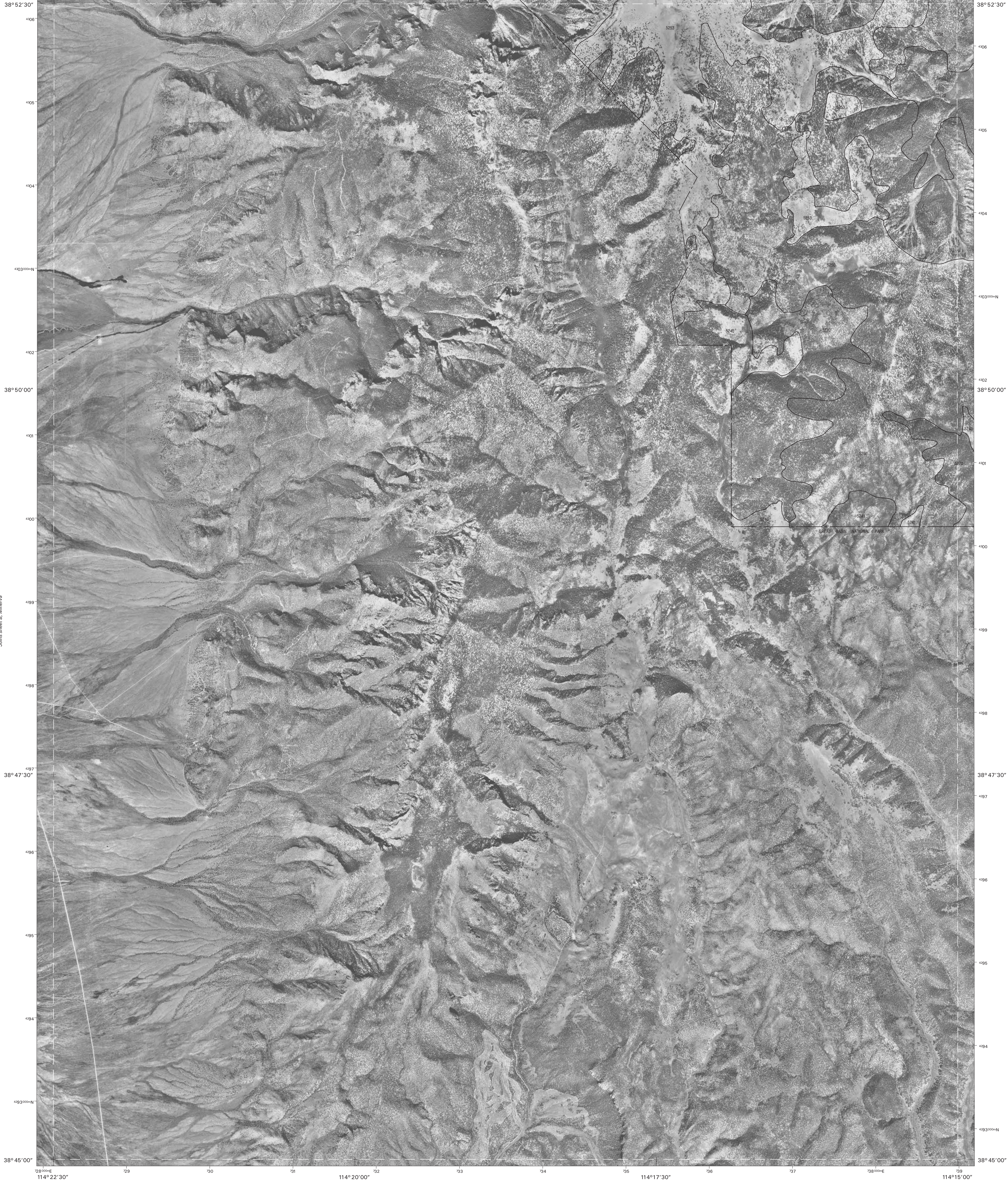
1	2	A
3		B
5	6	C

INDEX TO ADJOINING 7.5 MAPS

1 WINDY PEAK
2 LEHMAN CAVES
A BAKER
3 WHEELER PEAK
B GARRISON
5 MINERVA CANYON
6 ARCH CANYON
C NEEDLE POINT SPRING

KIOUS SPRING, NEVADA
7.5 MINUTE SERIES
SHEET NUMBER 4 OF 6

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.



Joins sheet C,
Indian Springs Knolls

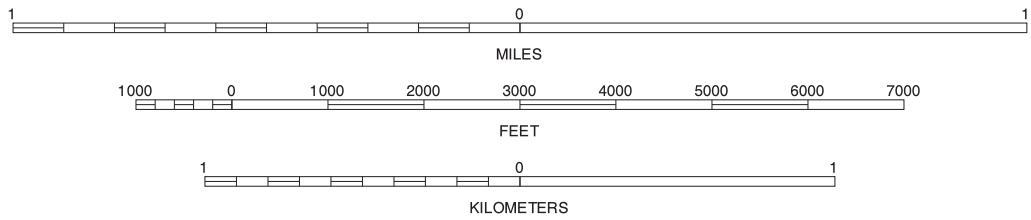
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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 11.
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NORTH
↑



QUADRANGLE LOCATION



A	3	4
B		6
C	D	E

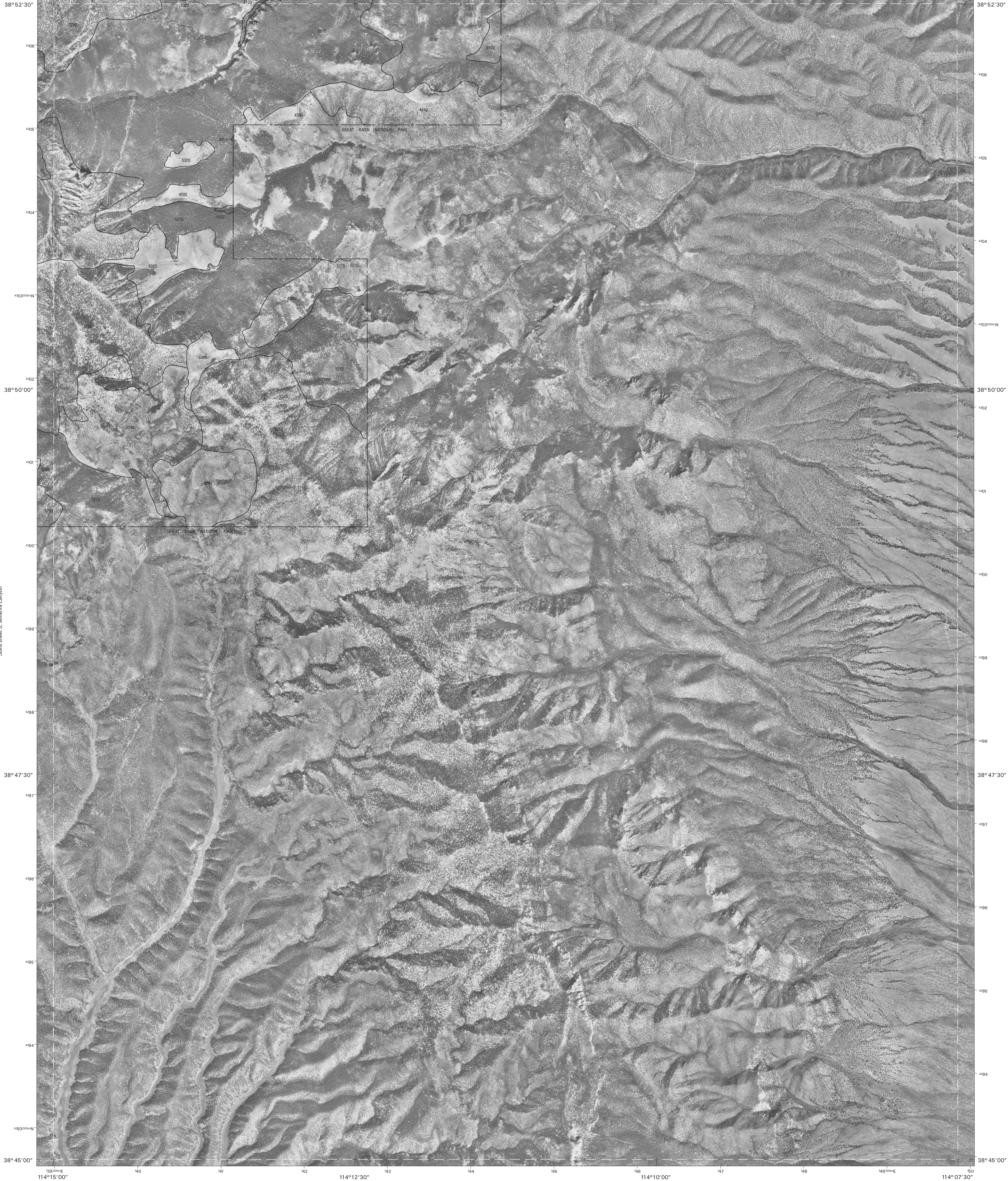
A BAKING POWDER FLAT
3 WHEELER PEAK
4 KIOUS SPRING
B MINERVA
6 ARCH CANYON
C INDIAN SPRINGS KNOLLS
D RED LEDGES
E BIG SPRINGS

INDEX TO ADJOINING 7.5 MAPS

MINERVA CANYON, NEVADA
7.5 MINUTE SERIES
SHEET NUMBER 5 OF 6

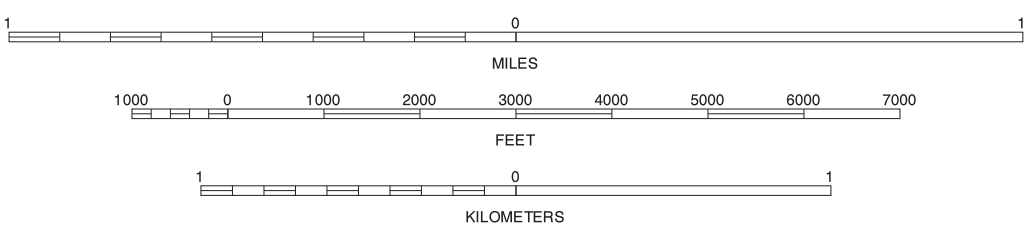
Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets.

Joins sheet E,
Big Springs



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 11. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



3	4	A
5		B
C	D	E

INDEX TO ADJOINING 7.5 MAPS

ARCH CANYON, NEVADA
7.5 MINUTE SERIES
SHEET NUMBER 6 OF 6

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